COUPON.

Name............................

Street....................

City...............

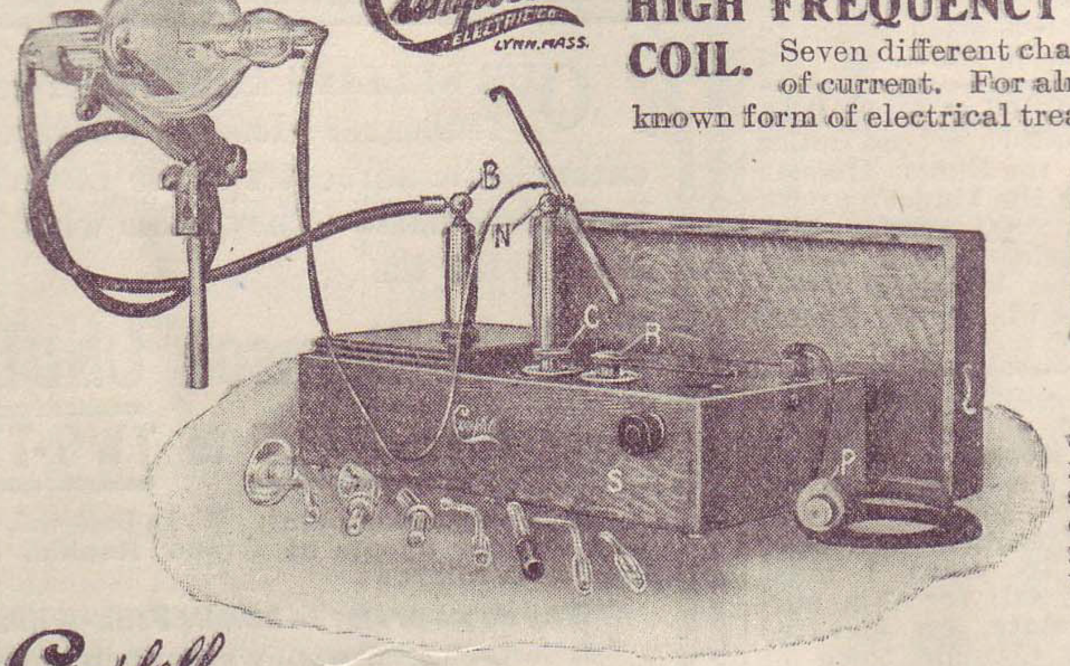
State........

....

DOCTOR, increase your revenue.

You can do it with a **CAMPBELL**

X-RAY and HIGH FREQUENCY COIL. Seven different characters of current. For almost every known form of electrical treatment.



PORTABLE POWERFUL PRACTICAL

Sign, tear off and mail above coupon. We will send you our unusual proposition, showing you how one of our outfits can be procured by you with practically no investment on your part.

Sign and Mail NOW

CAMPBELL ELECTRIC CO., MAIN OFFICES AND FACTORY, LYNN, MASS.

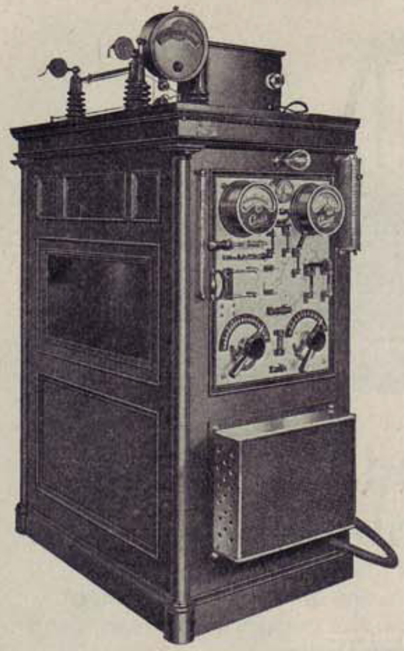
BRANCH OFFICES: NEW YORK: 110 E. 23rd St. PHILADELPHIA: 321 Mint Arcade

(C) Jeff Behary c/o The Turn Of The Century Elecrtrotherapy Museum 2007

Campbell
ELECTRIC CO.
LYNN, MASS.

X-RAY AND ELECTRO-THERAPEUTIC APPARATUS

Interrupterless Transformers
X-Ray Tables
Tube Stands
X-Ray Tubes
Stereoscopes
High Frequency Coils
Treatment Chairs
Intensifying Screens
Cassettes
Accessory Equipment



Patented

Sure-X

INTERRUPTERLESS TRANSFORMER

Auto Transformer Control (if preferred)
Closed Core Transformer
Secondary Voltmeter
Selective Inductance
Self-starting Synchronous Motor
Monoplate Rectifier
Polarity Indicator

The Sure-X simplifies technique and insures uniformity of result.

Patented

MODEL I HIGH FREQUENCY COIL

Designed especially for Electro-Therapeutic work, delivers X-Ray Current sufficiently powerful for treatment or radiography of bone structure.
The Model I Coil produces the following currents—X-Ray, Tesla or Oudin, Fulguration, Cataphoric, Thermo-Faradic, Diathermic, D'arsonval, Cautery, Diagnostic Lamp, Sinusoidal.

Descriptive literature sent upon request.

Campbell Electric Corp.
LYNN, MASS, U. S. A.

Campbell

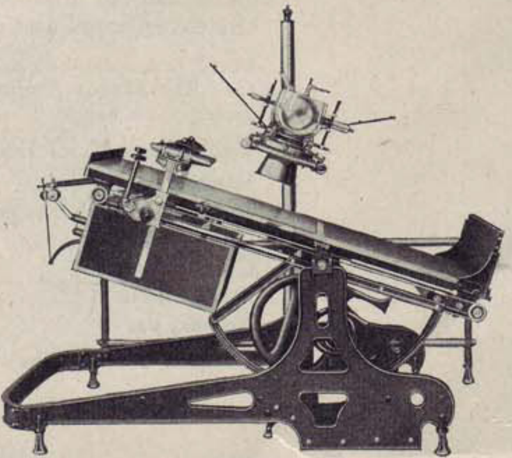
TUBE TILT TABLE

Fluoroscopic and Radiographic examinations in any position—Vertical, Horizontal, Trendelenburg, Angular.

Fluoroscopic examinations may be made from head to foot in all of the various positions without moving the patient. Stereoscopic Radiographs may also be made in any position.

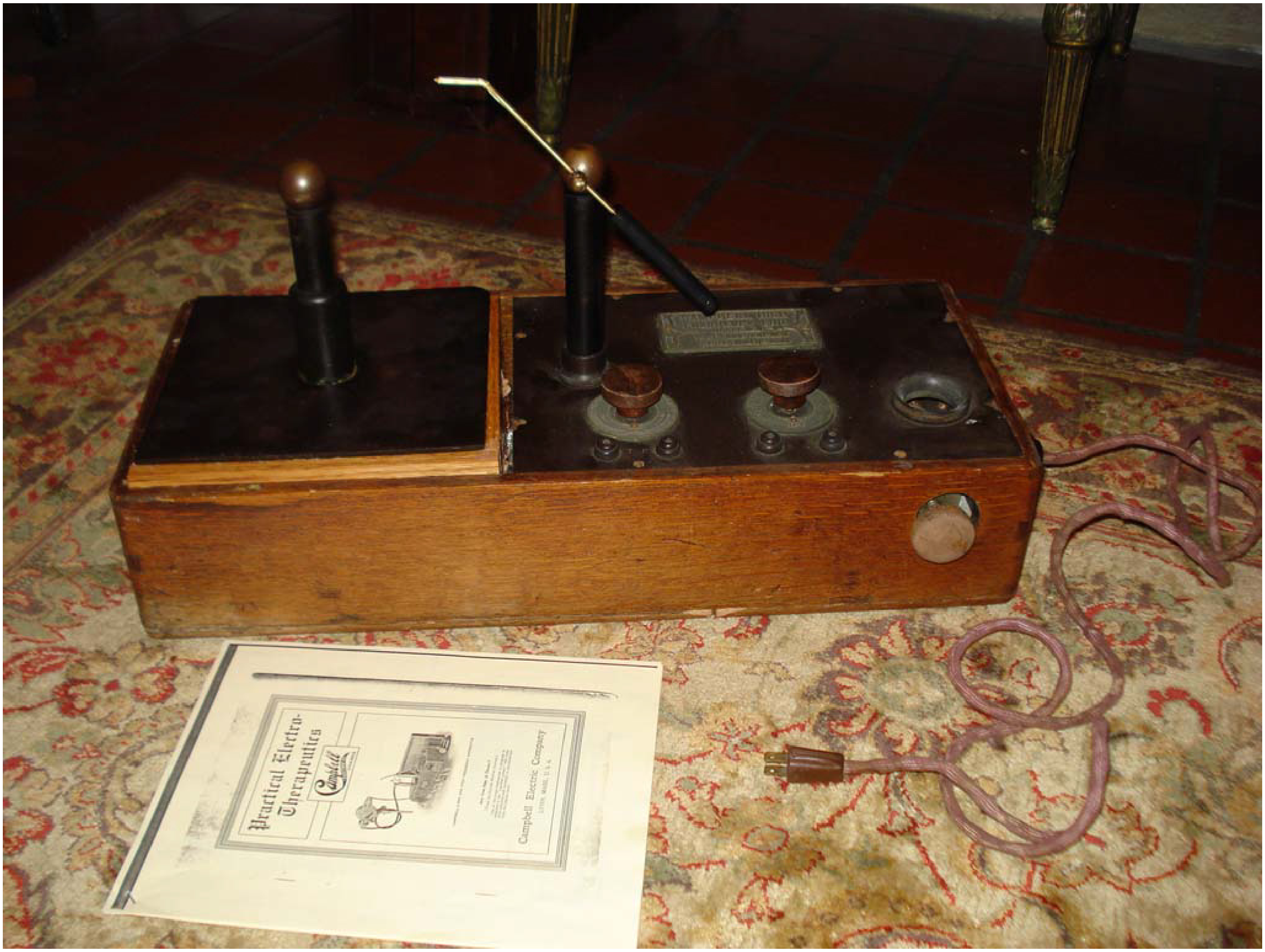
The Tube Tilt Table is extremely flexible of adjustment.

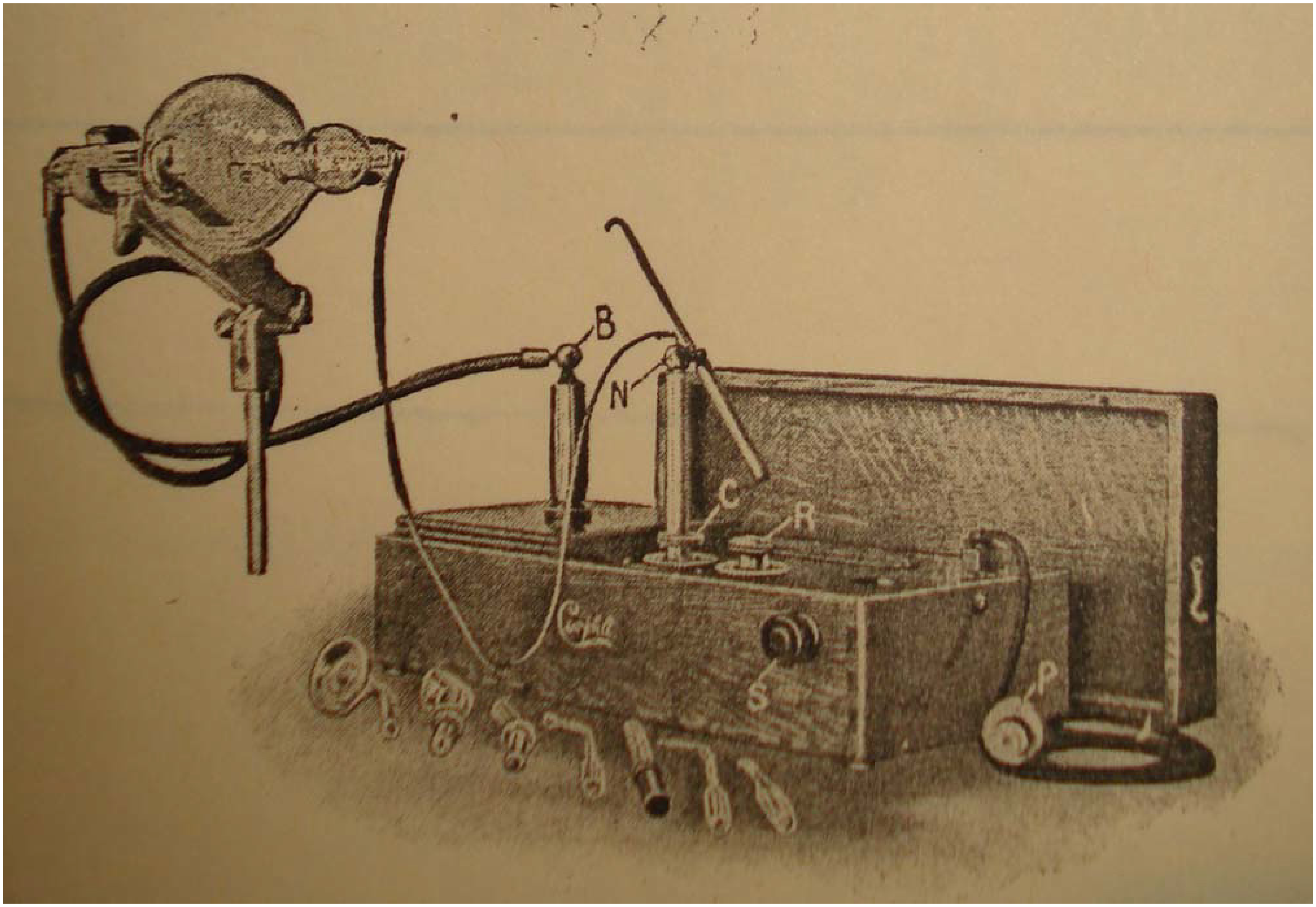
"TUBE TILTS WITH TABLE"



Patented

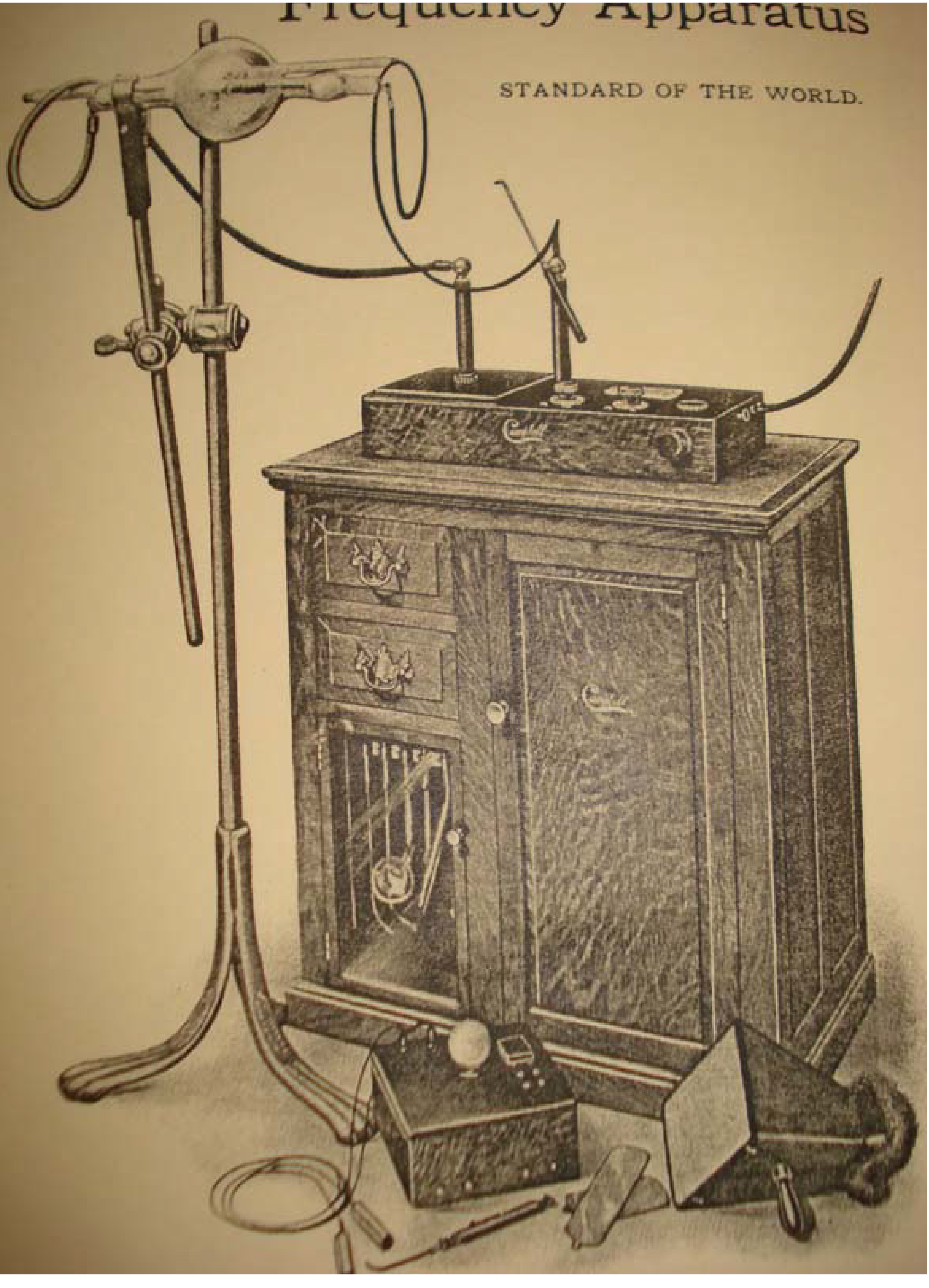
Cooktop II

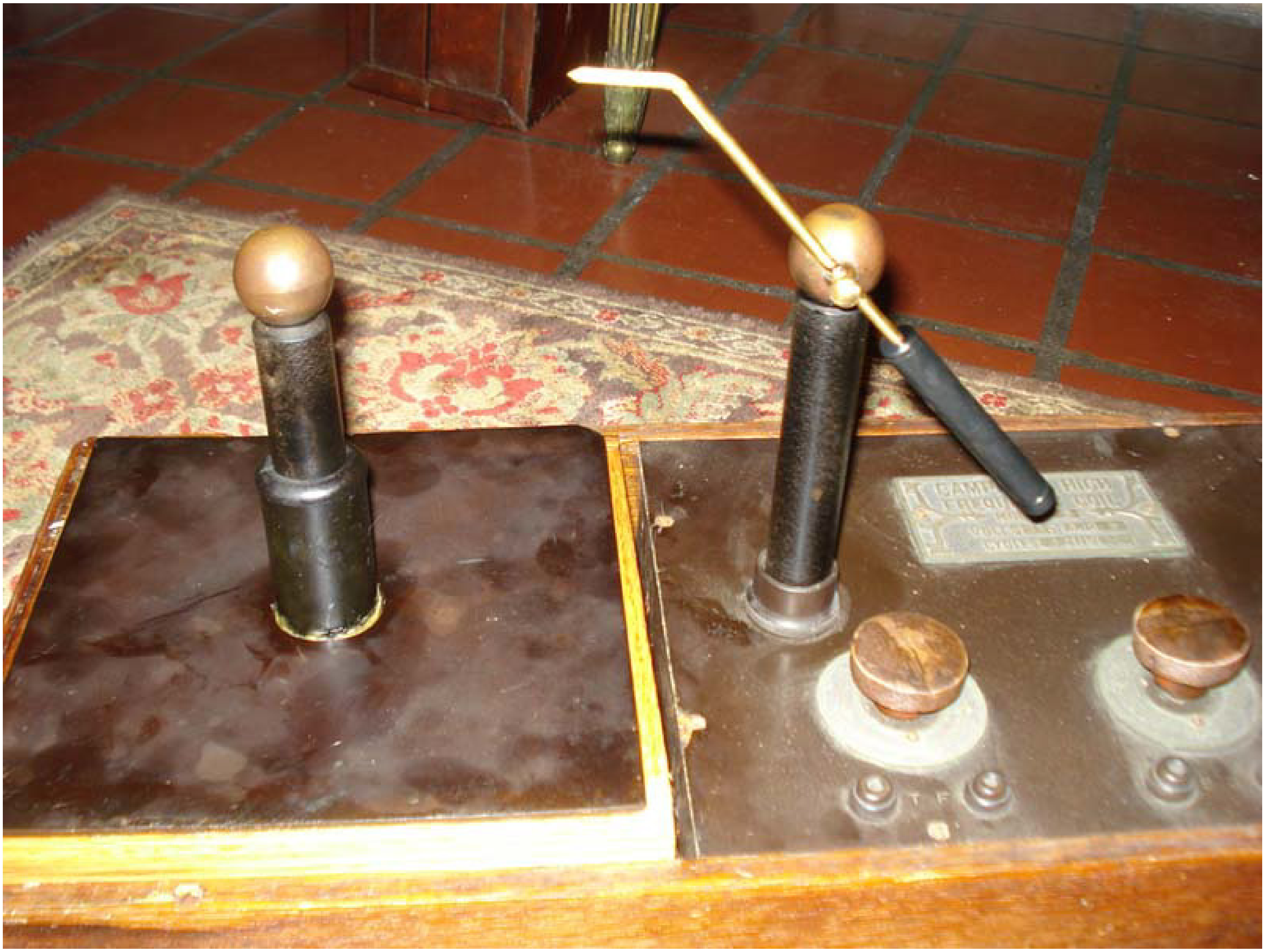

Practical Electro-Therapeutics
Campbell
Campbell Electric Company
Lynn, Mass., U.S.A.

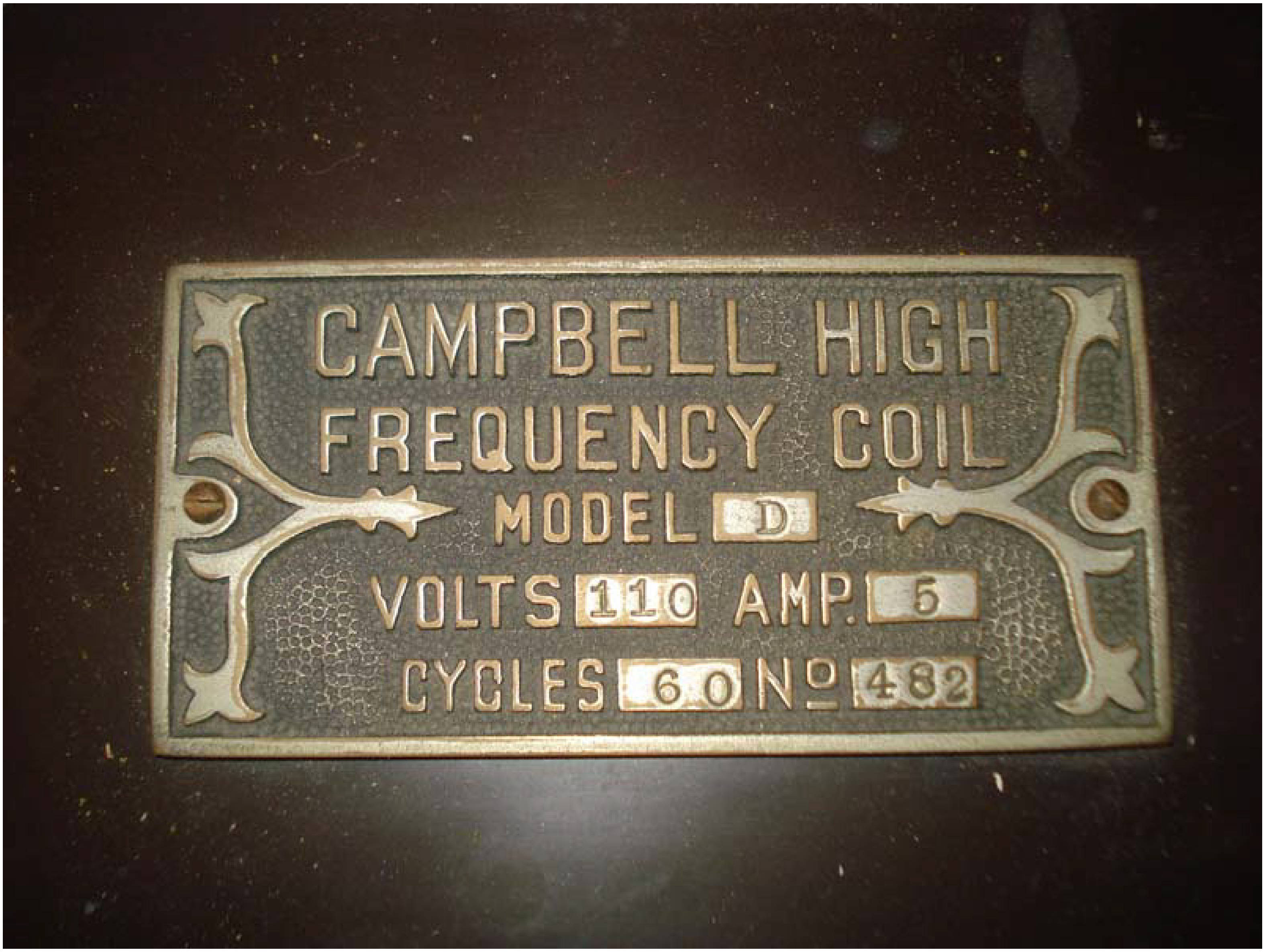

B
N
C
R
S
P

Frequency Apparatus

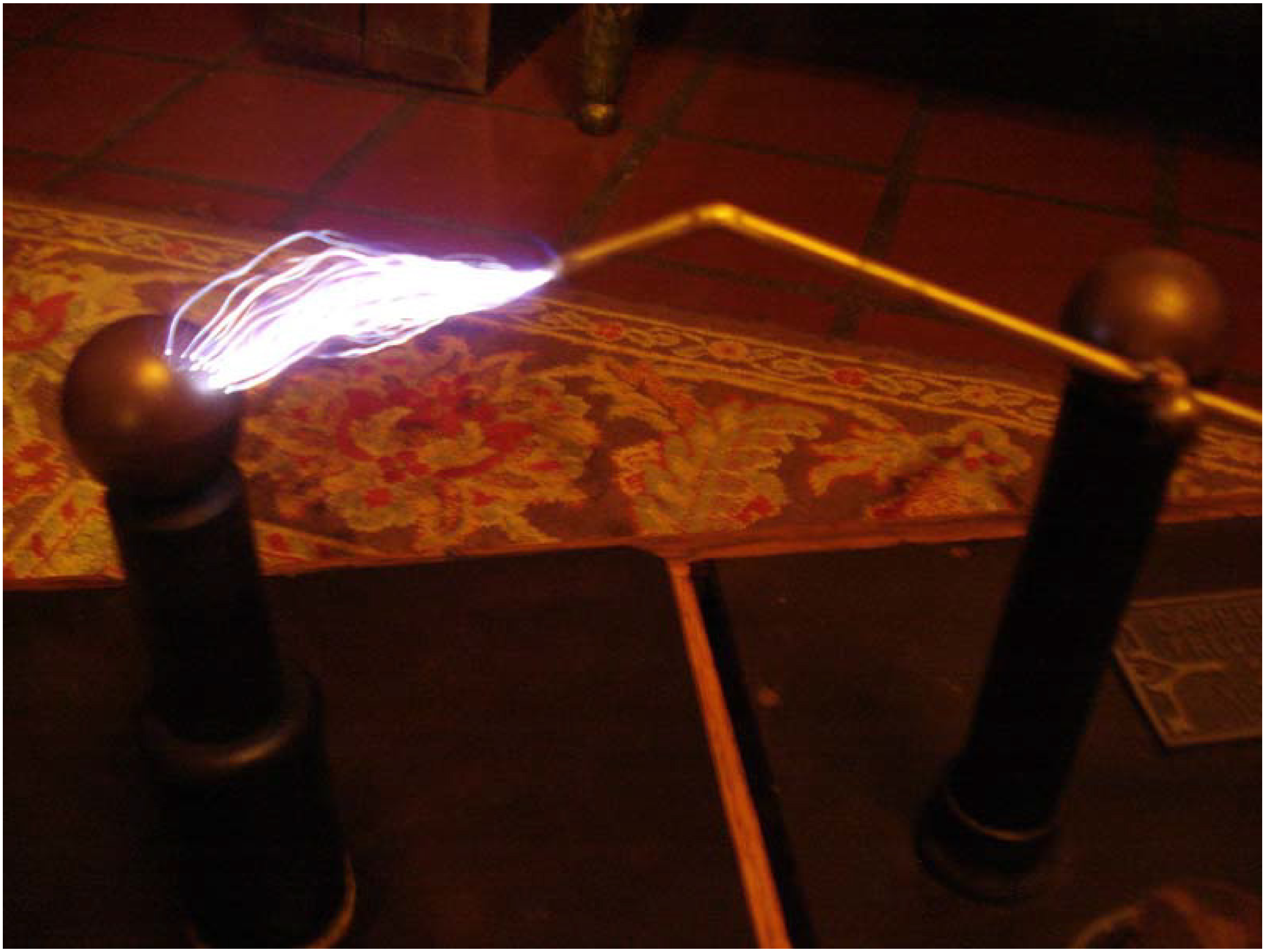
STANDARD OF THE WORLD.

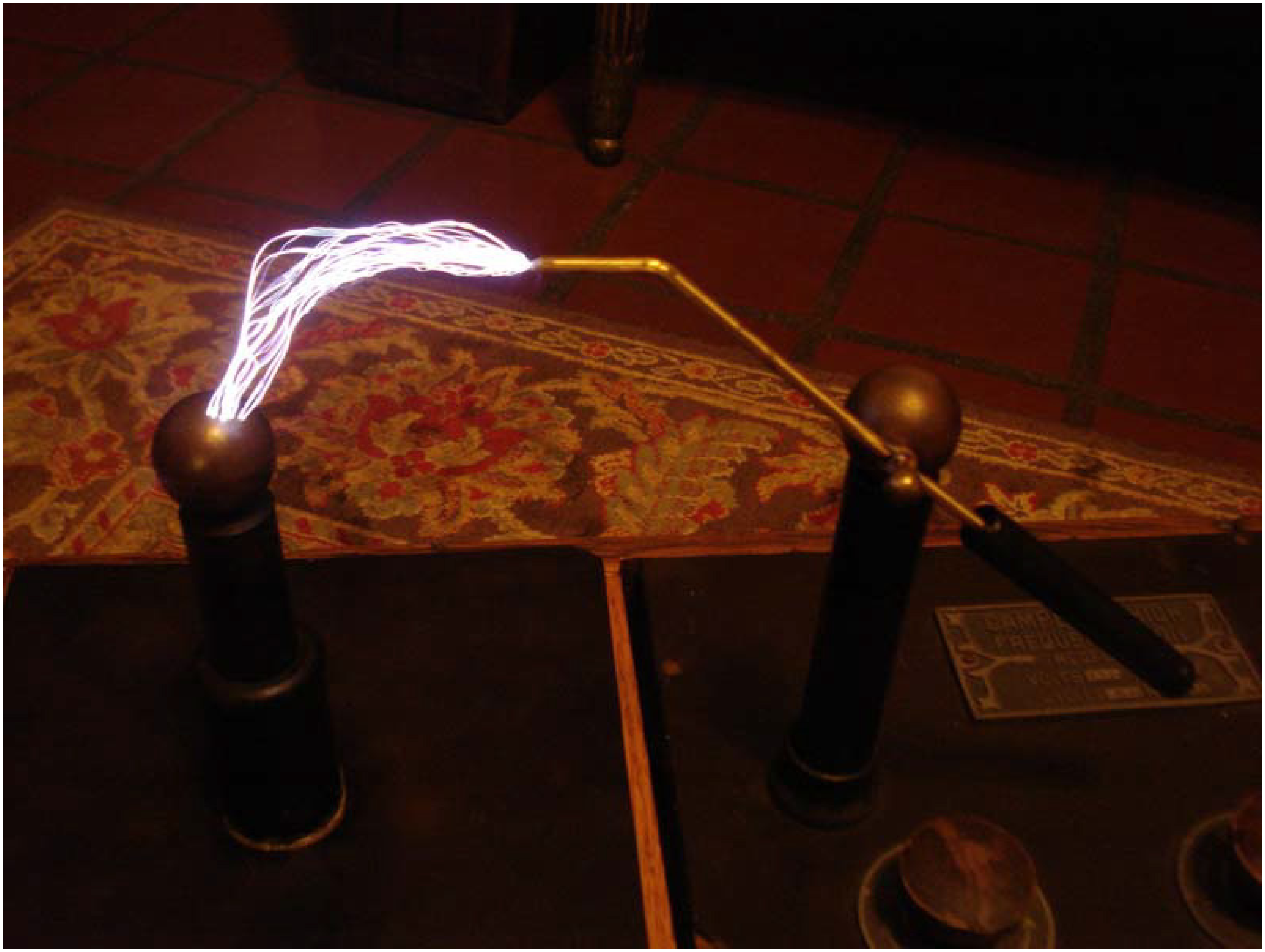



CAMP HIGH
FREQU COIL
T F

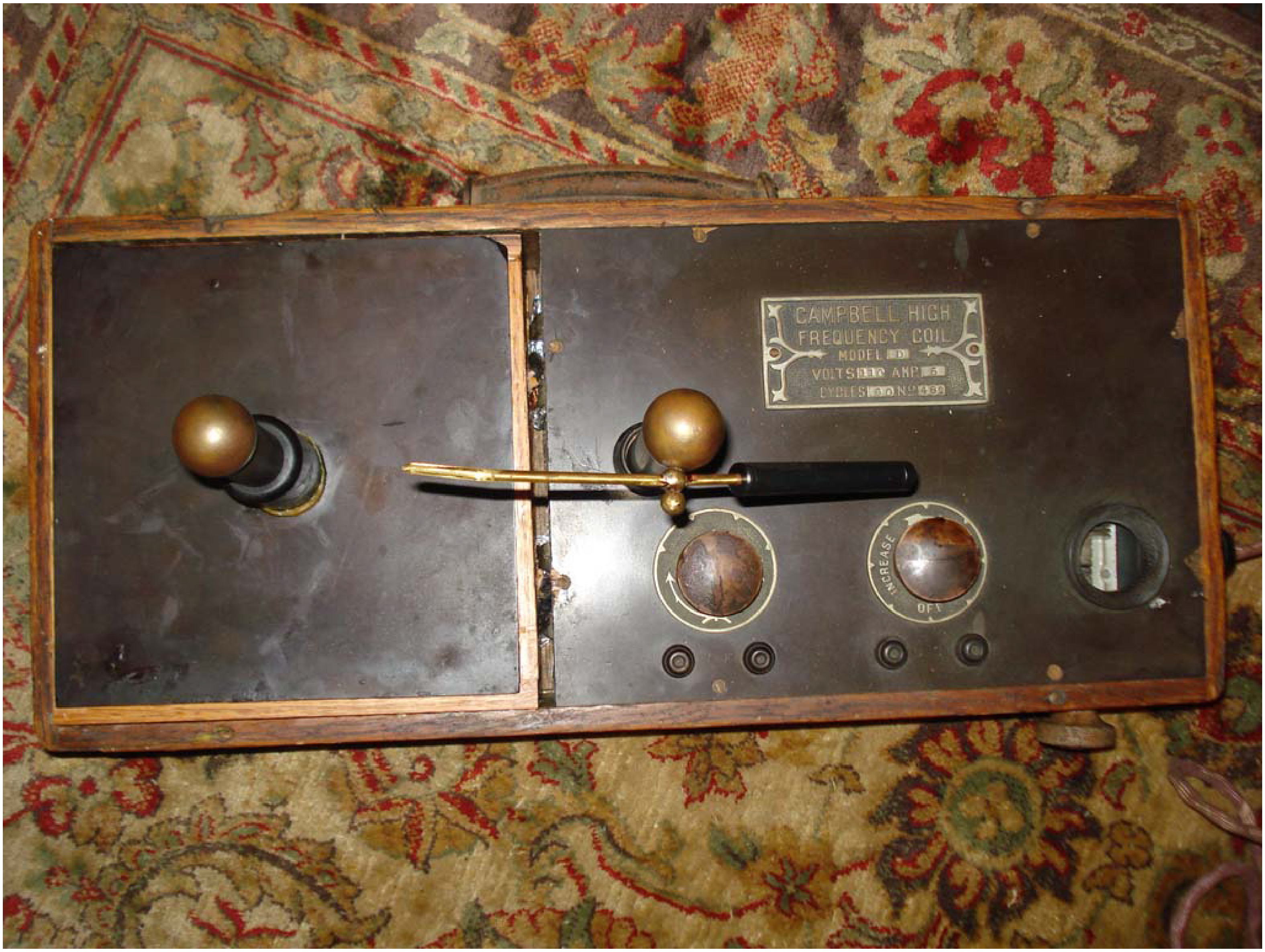

CAMPBELL HIGH
FREQUENCY COIL
MODEL D
VOLTS 110 AMP. 5
CYCLES 60 Nº 482

CAMPBELL
FREQUENCY





CAMP
HIGH
FREQU


CAMPBELL HIGH
FREQUENCY COIL
MODEL D
VOLTS
AMP
CYCLES
No
INCREASE
OFF

FRED RUPERT CAMPBELL, an enterprising manufacturer of Lynn, and prominent in fraternal circles, is broadly active in the progress of the city. He was born in Lynn, December 6, 1878, a son of Edward Thomas and Augusta J. (Oakes) Campbell, for many years residents of this city.

Gaining his education in the public schools of the city, Mr. Campbell, in association with his brother, Charles Edward Campbell, whose life is reviewed elsewhere in this work, has reached a prominent position among electrical manufacturers in this part of the State. The business was formerly located on Central square, and for a time embraced a retail store, dealing in electrical supplies of every kind. Twice selling out, the second time to the General Electric Company, the business was removed to Stewart street, absorbing the business of Charles E. Howard in 1915, and in 1916 the fine new building of the Campbell Electric Company was erected and equipped for the special line of work turned out. This consists of X-ray equipment, such as is used in hospitals and by physicians, many varieties of electrical equipments, transformers and automatic switching devices. This business is one of the successful interests in its field in this section. In addition to holding an interest in this business, Mr. Campbell is treasurer of the X-ray Foot-O-Scope Corporation, and active in its management. He is also a director of the State National Bank, of Lynn, and of the Lynn Morris Plan Company, and is a member of the Lynn Chamber of Commerce.

Fraternally Mr. Campbell is a member of the Golden Fleece Lodge, Free and Accepted Masons; of Sutton Chapter, Royal Arch Masons; of Olivet Commandery, Knights Templar; and is also a member of the Ancient Arabic Order Nobles of the Mystic Shrine. He is a member of Peter Woodland Lodge, Knights of Pythias, and of Lynn Lodge, Benevolent and Protective Order of Elks. He attends the Episcopal church.

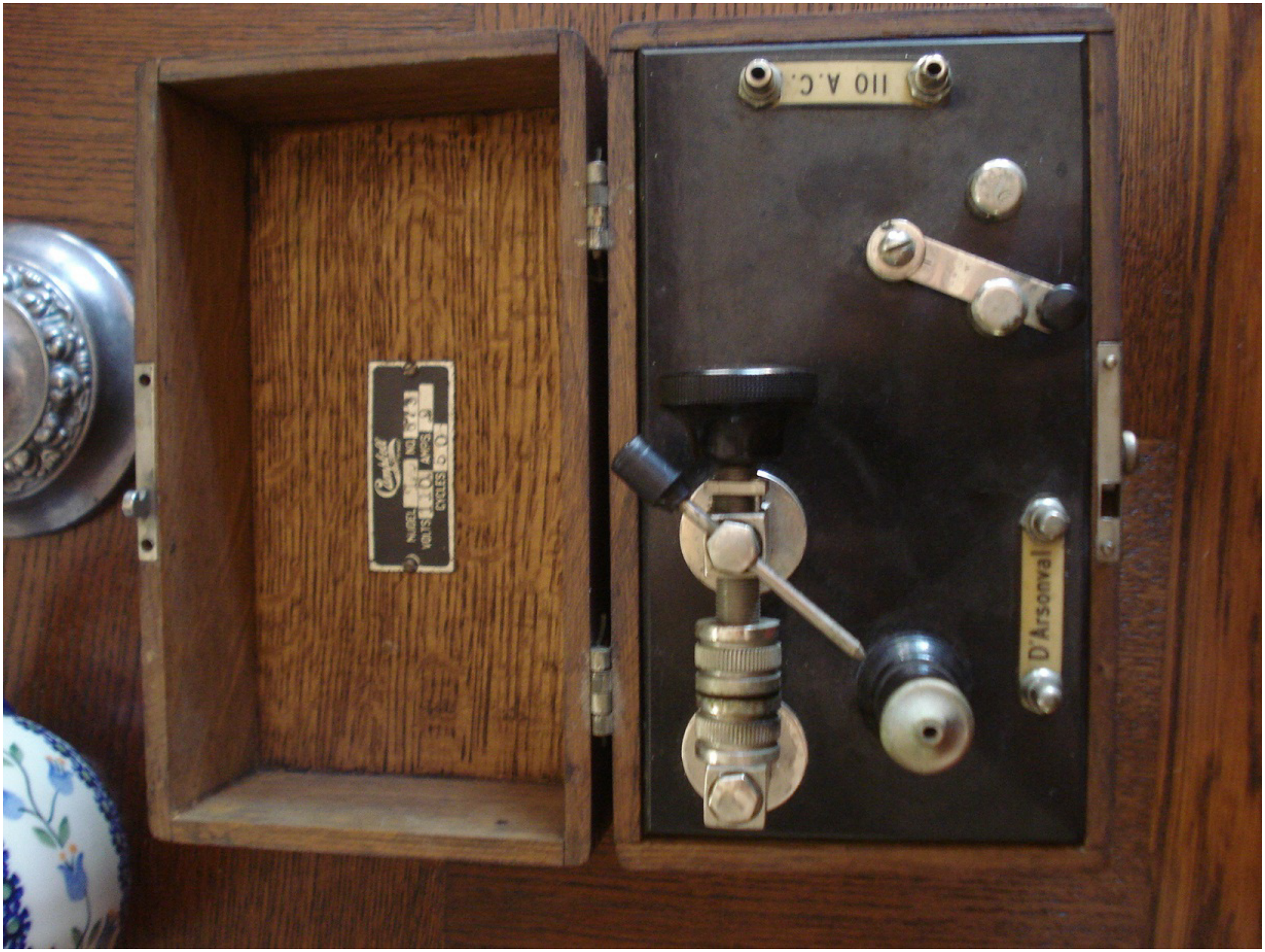
On November 24, 1904, Mr. Campbell married Amy E. Fletcher, daughter of Nathan B. and Emily Clapp (Lewis) Fletcher. Mr. and Mrs. Campbell have two daughters: Doris Evelyn, born November 18, 1905; and Ruth Fletcher, born December 25, 1913.

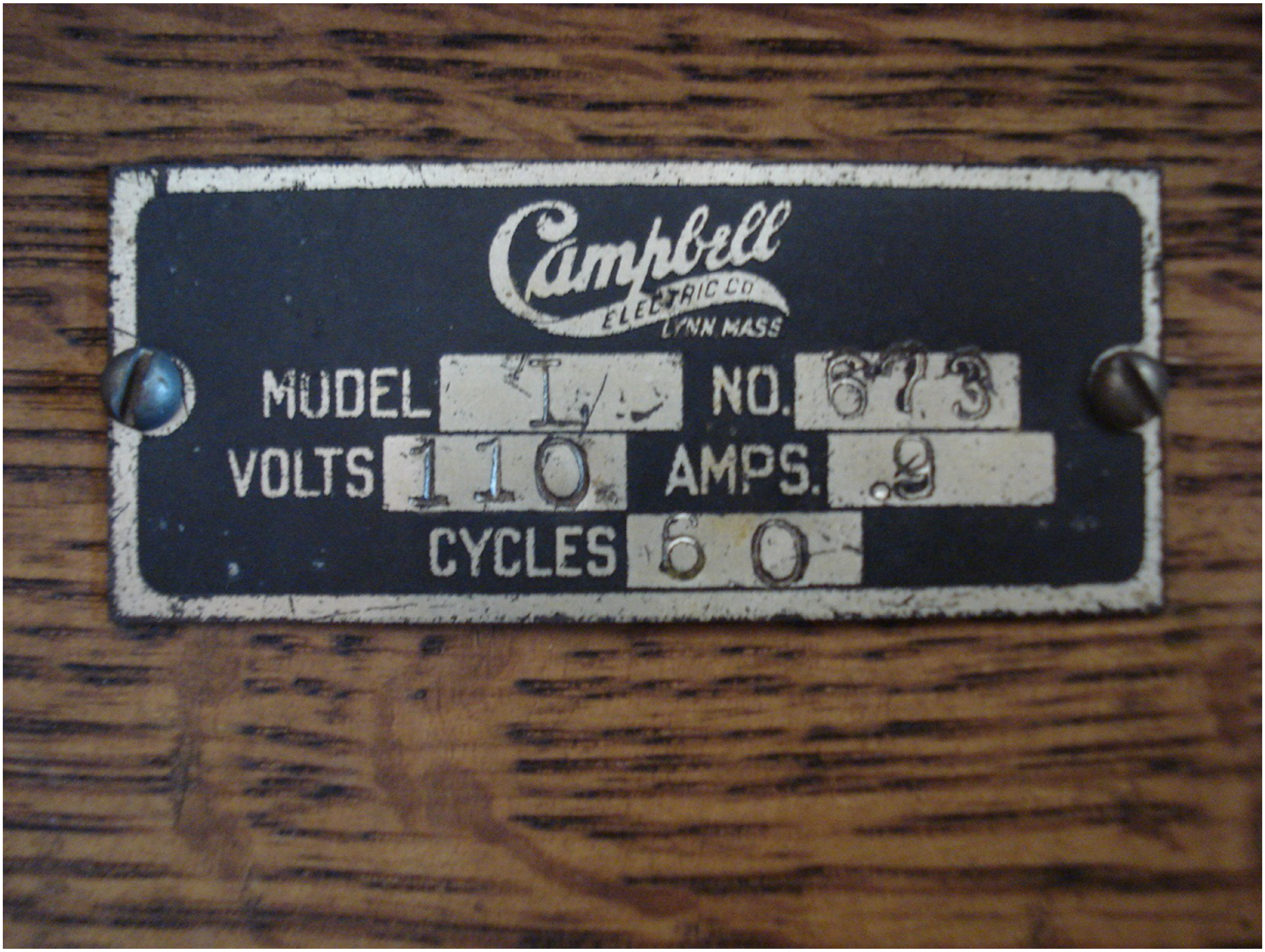
CHARLES EDWARD CAMPBELL—Achieving success entirely by his own efforts, Charles E. Campbell, of Lynn, now conducts an important business in the manufacture of many different electrical devices of especial significance to the public.

Mr. Campbell was born in Lynn, January 11, 1881, and is a son of Edward T. and Augusta J. (Oakes) Campbell. After completing the course of the public schools of his native city, Mr. Campbell was employed in a shoe factory for a short time, then went to Boston and Medford, doing experimental work on telephones. Following this line of activity for about three years, he then opened a small shop in Lynn, and did electrical work on a very modest scale. By constant effort he increased the business materially, and in 1900 opened a larger shop at No. 54 Central square, his plant first being in the basement, then on the top floor of the building, eventually expanding to fill the entire top floor. In 1906 Mr. Campbell added to his interests by opening a retail store, handling electrical supplies of all kinds, and this continued until 1909, when he sold out his entire business and made a fresh start, this time locating in the Fabian building on Union street. There he manufactured incandescent lamps and x-ray tubes for about three years, when he sold out to the General Electric Company. Removing to Stewart street, he still continued in the manufacturing branch of the business, and in 1915 purchased the business of Charles E. Howard, one year later erecting the Campbell Electric building, his present fine structure, equipping it in the most modern and approved manner. Here he specializes in the manufacture of x-ray equipment for the use of hospitals and physicians, electrical equipments, transformers, and automatic switching devices. He is doing a constantly increased business, and is one of the successful men in this field in Essex county. His brother, Fred R. Campbell, has long been associated with him. (q.v.)

Mr. Campbell is a member of the Free and Accepted Masons and of the Benevolent and Protective Order of Elks. He is a member of the Rotary Club, and attends the Episcopal Church of the Incarnation. In 1909 Mr. Campbell married Laura C. Chellis.

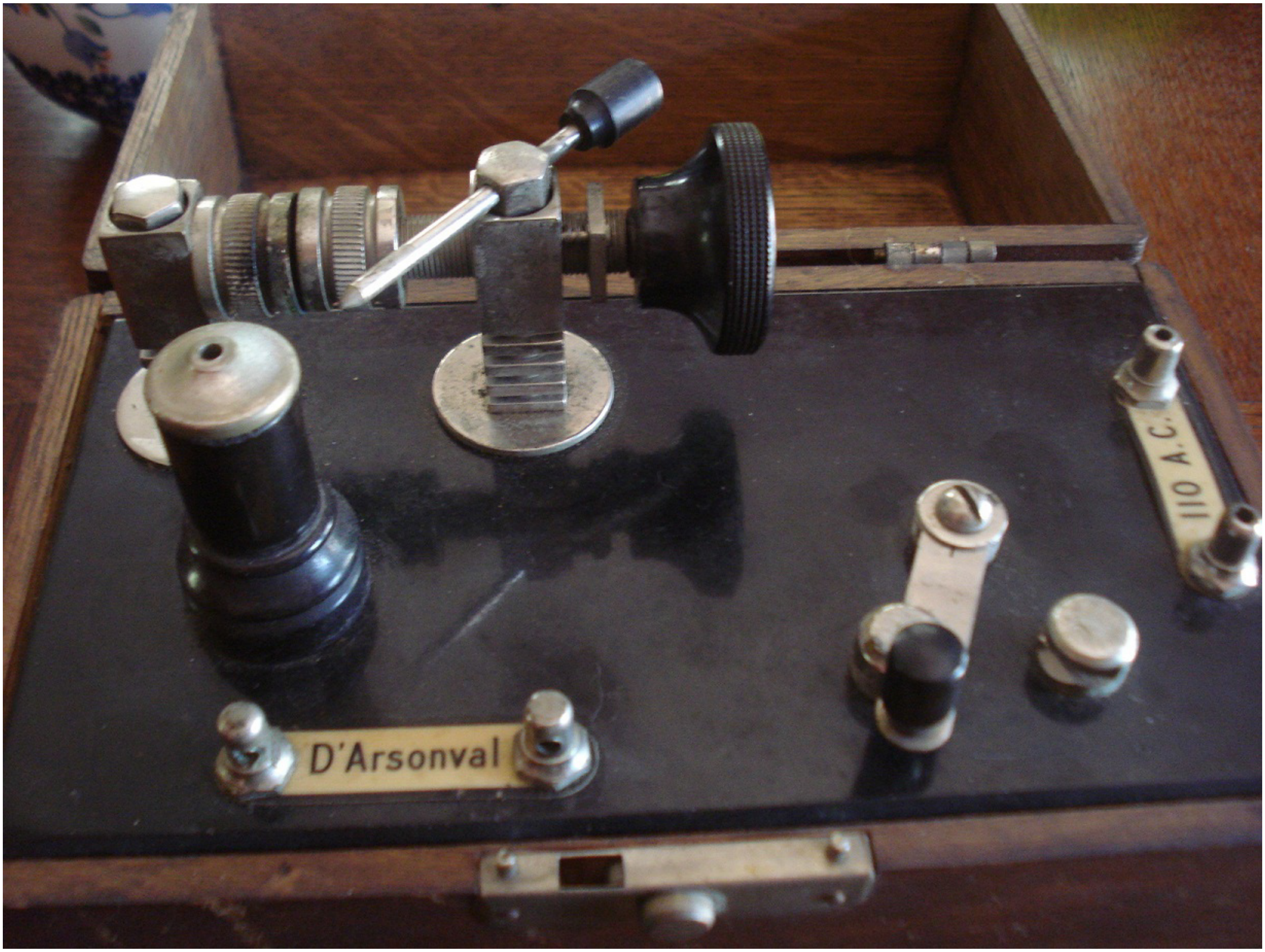
Charles E. Campbell.


110 A.C.
D'Arsonval
Campbell
MODEL
NO
VOLTS 110
AMPS
CYCLES 60

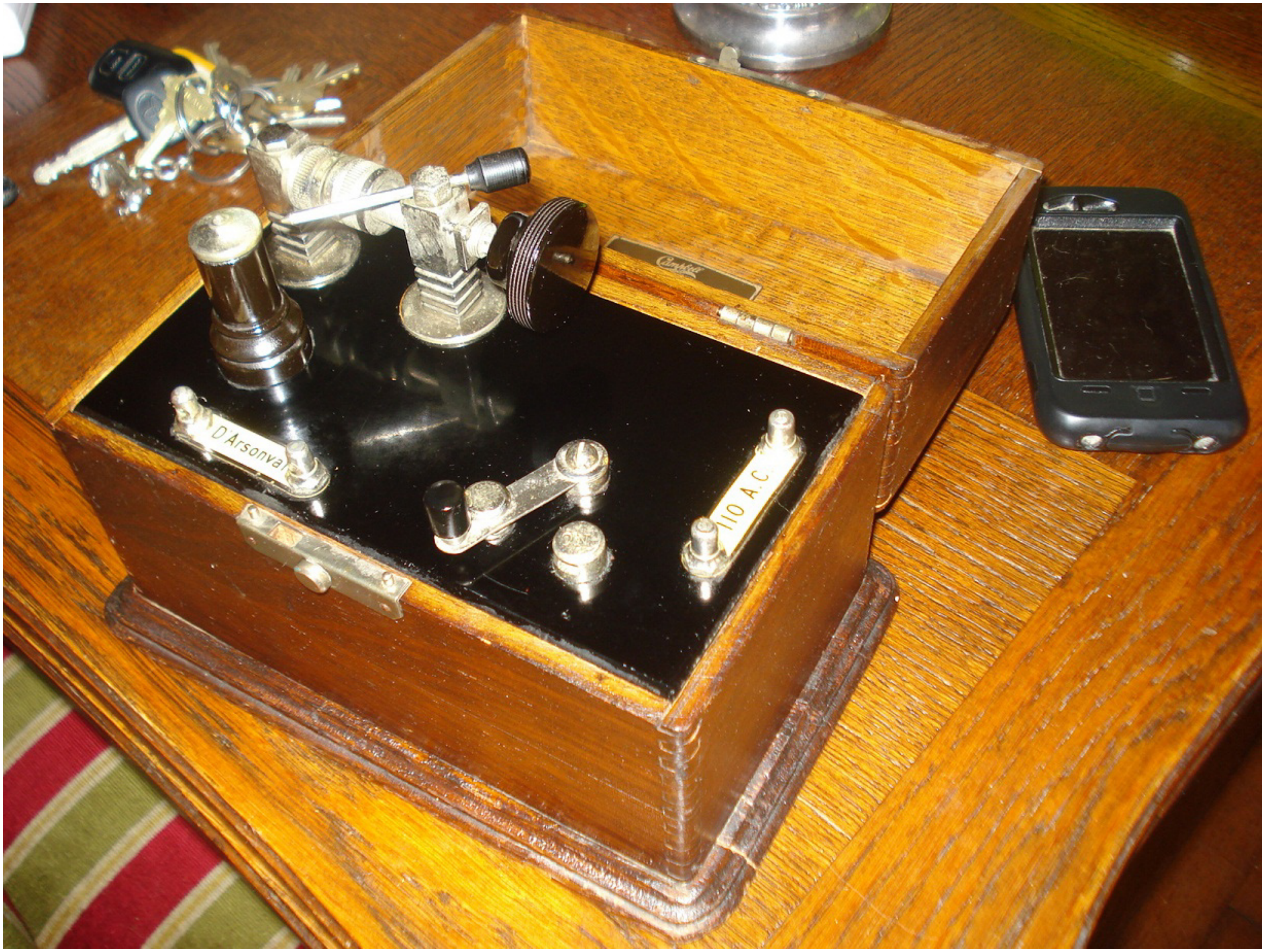


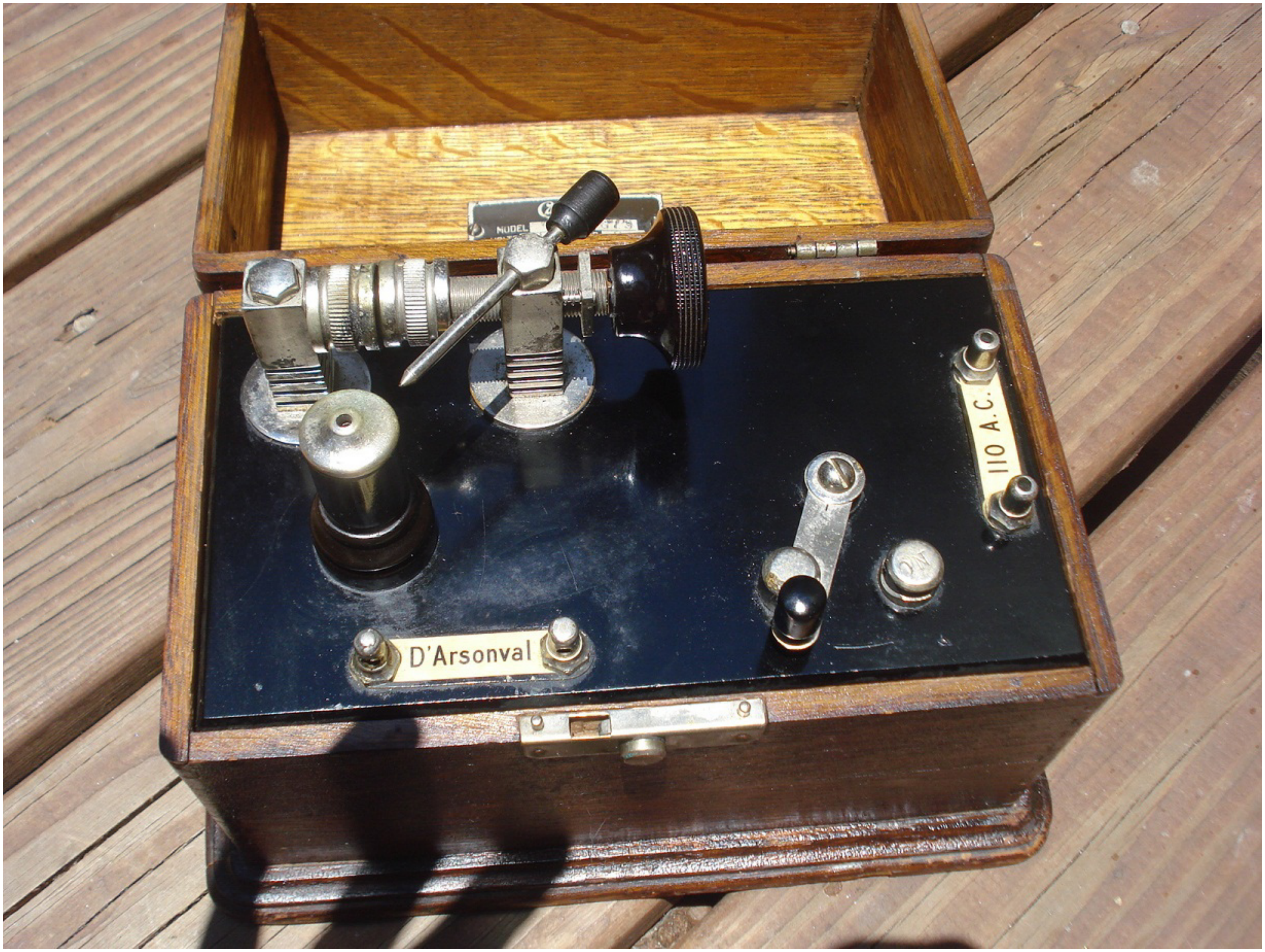
Campbell
ELECTRIC Co
LYNN MASS

MODEL L NO. 673
VOLTS 110 AMPS. .9
CYCLES 60


D'Arsonval
110 A.C.

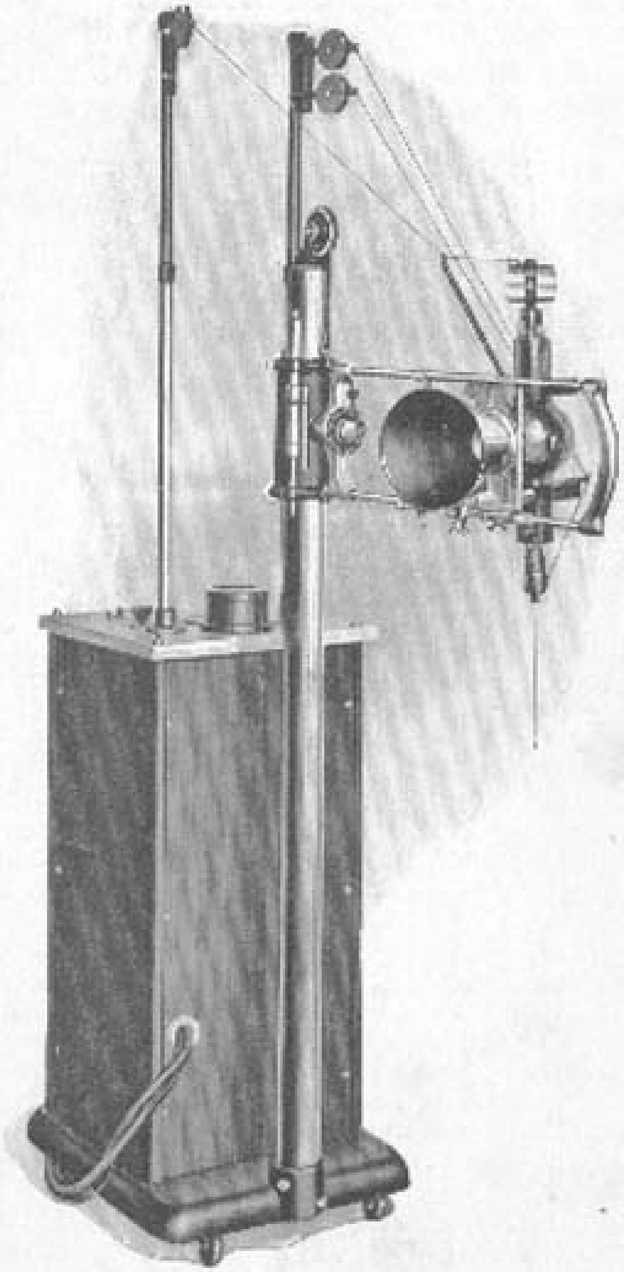
Campbell's
CONDENSED
GREAT FOR COOKING
Cream of Mushroom
SOUP
D'Arsonval
110 A.C.


D'Arsonva
110 A.C


MODEL
D'Arsonval
110 A.C.
ON

Campbell
Coolidge
Clinical
X-RAY UNIT

3799



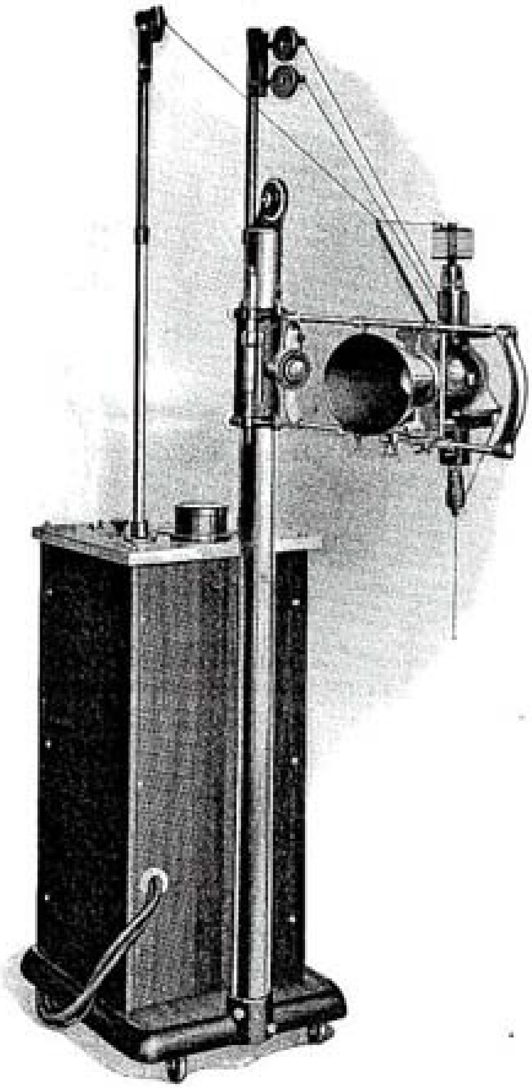
CAMPBELL CLINICAL X-RAY UNIT

U. S. Patents
December 19, 1911; April 22, 1913; August 7, 1917.
Other Patents Pending.

Cat. No. 2084

Campbell
Coolidge
Clinical
X-RAY UNIT

37[illegible]



CAMPBELL CLINICAL X-RAY UNIT

U. S. Patents
December 19, 1911; April 22, 1913; August 7, 1917.
Other Patents Pending.

Cat. No. 2084

Campbell
Coolidge
Clinical
X RAY UNIT

CAMPBELL CLINICAL X-RAY UNIT

3-inch gap, 1 to 30 milliamperes; 4-inch gap, 1 to 30 milliamperes; 5-inch gap; 1 to 30 milliamperes.

For nearly every kind of Radiography and Fluoroscopy.
Silent — Always ready — Uniform Results.

(Capacity — Any work within the range of 1 to 30 milliamperes with 3″ to 5″ spark gap)

(See U. S. Army Manual and Eastman or Campbell X-ray Exposure Rule.)

No Physician's, Dentist's nor Hospital's equipment is complete without a Campbell Clinical X-ray Unit.

The greatest hindrance to more universal use of X-ray has been the inability of the average operator to readily master the adjustment of the apparatus in order to obtain satisfactory results.

In the Campbell Coolidge Clinical X-ray Unit the **Current** and **Voltage** (which regulate time of exposure and penetration) are **Fixed Quantities** instantly ready for use by pressure on the switch, and without the annoyance of the noise and adjustments of spark gaps, tube vacuum, etc.

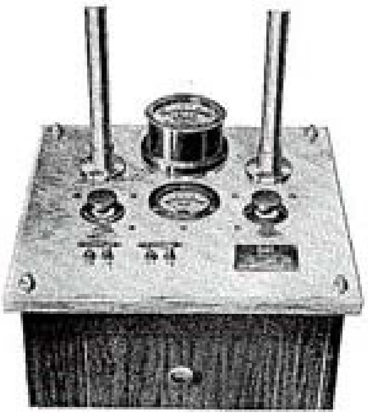
The apparatus is especially constructed with sufficient capacity and suitable regulation for operation of either the ten milliampere or thirty milliampere Coolidge Radiator self-rectifying X-ray tube with a 3″ to 5″ spark gap, which is sufficient to radiograph or fluoroscope any part of the body, thus approaching as nearly as possible all the advantages of the Sure X interrupterless transformer.

One of the principal advantages of this apparatus, which is fully covered by U. S. Patents, is that by slight adjustment of the voltage and current regulators the current may be changed to any volume from 1 to 30 milliamperes at a 3″, 4″ or 5″ gap, always maintaining the selected voltage at the tube terminals regardless of the load which in the ordinary apparatus would cause fluctuation in the penetrative value of the X-rays, uniform maintenance of which is so necessary in order to establish the exposure technique which in results marks the difference between the expert Roentgenologist and the one who is rated as of mediocre attainment.

This equipment in connection with Eastman Dupli-Tized films and double intensifying screens, one on either side of the film, will produce wonderfully rapid work. For Dental and the majority of other work, no screen is needed.

The entire apparatus is one complete unit easily moved about and is instantly ready for use by connection to the ordinary electric light circuit for use with ten milliamperes in the tube, but for use of the thirty milliampere tube it is advisable to connect to a special circuit o No. 6 or 8 wire on account of fire underwriters' regulations relative to carrying capacities wiring circuits.

The whole outfit is the evolution of many years of combined research work, and is a model of efficiency, beauty and durability such only as this company of twenty years' experience in the manufacture of all kinds of X-ray apparatus for the physician, dentist and hospital will offer to the profession.



The Control Board

SPECIFICATIONS

Cabinet. Fireproof, entirely of metal, beautifully finished, with white marble top, polished nickel trimmed. All parts of cabinet are interchangeable so that in case of injury a new panel, corner, base, or marble top may be quickly replaced without expense of an entire cabinet. This method of construction allows the ready removal of all four side panels, thus leaving all internal parts of the apparatus easily accessible, very rigid, and absolutely fireproof.

Equipped with ball-bearing casters attached to the cast base.

The regular finish is Mahogany.

Control Board. White marble equipped with voltmeter; milliamperemeter; spark regulator; filament regulator; auto transformer control; high tension masts with grounded metal casings; filament switch and main switch.

High Tension Transformer. Secondary 65,000 volts. Closed core, oil insulation, metal tank Sufficient capacity to deliver 1 to 30 milliamperes to the X-ray tube with 3″ to 5″ gap.

Filament Transformer. A separate transformer mounted in same case with high tension transformer. Oil insulated.

Auto Transformer. Compensates for difference in line voltage.

Control. Voltage and volume are simultaneously regulated by turning a regulator handle located on Control Board. This method of control compensates for rise and fall in line voltage and consequent fluctuation of penetrative value of the X-rays. Filament current may also be very finely controlled by turning a regulator handle on front panel of cabinet. Auto Transformer is adjusted by Voltage Regulator on control board. By adjusting this regulator until the voltmeter reads 110 volts, the spark gap desired is assured with any load, if line capacity is sufficient. Lack of line capacity may be quickly determined by noting whether or not voltmeter indicates drop in line voltage when load is turned on.

Reels. For Connecting Wires. Self-winding, mounted on high tension masts.

Foot Switch. Quick make and break prevent arcing and burning of contacts.

Current Required. Operates on alternating current of from 100 to 120 volts, 40 to 60 cycles, 6 to 35 amperes, according to current used in tube. Also on direct current by addition f rotary converter mounted in bottom of cabinet for the ten milliampere tube. For the thirty lliampere tube, it is necessary to mount the converter, on account of its large size, separate m the cabinet.

Tube Stand. Counterweighted. Wide range of adjustment of tube with stereoscopic shift, vertical and horizontal. Highly finished in polished nickel plate. Mounted in heavy cast base of cabinet.

Protection from X-ray. The standard and approved Coolidge special heavy glass tube shield completely enclosing tube. Made of lead glass equivalent in protection to approximately ⅛″ metallic lead.

Protection to Apparatus, Patients and Operator. No exposed current carrying parts on Control Board. Mica High Tension Masts with Metal casings grounded through resistance. Standard approved cutout in bottom section of cabinet with cartridge fuses.

Tube. Self-rectifying Coolidge Radiator type, either the ten or thirty milliampere.

Patents. This apparatus is protected by U. S. patents issued December 19, 1911, April 22, 1912, and August 7, 1917. Other patents are pending.

OUTFIT

Coil. A. C., 110 volt, 60 cycles, including cabinet, transformers, regulators, meters, etc. Catalog No. 2084.
Tube Stand. Counterweighted. Stereoscopic. Catalog No. 1255.
Foot Switch. Carbon make and break. Catalog No. 1037.
Glass Shield. Lead protective. Bedside type. Catalog No. 1260.
Coolidge Tube. Bedside Radiator type, either the ten or thirty milliampere.

Catalog No. 1270.

Outfit complete, boxed ready for shipment F. O. B. Lynn ....
Extra for Automatic Time Controller (times exposure and breaks circuit). Catalog No. 2081,
Extra for use on 110 volts, D. C. (10 milliamperes through tube) ....
Extra for use on 110 volts, D. C. (6 milliamperes through tube) ....

There is also a Campbell Coolidge Dental Unit which is designed for Dental X-ray exclusively. It delivers 10 milliamperes at only a 3″ spark gap, which is ideal penetration for the teeth, but not sufficient for sinus and other deep work.

There is a Campbell X-ray or Electrotherapeutic outfit for every known field of use.

Send for complete catalog.

Campbell Apparatus sold by Reliable Dealers, supported by Factory Service Men.

ACCESSORIES

The following accessories are suggested for selection to make a more complete outfit.

Hand Fluoroscope — Size 8″ x 10″ with Lead Glass. Catalog No. 1039 ....
Plate Changing Tunnel — Size 12″ x 12″. Catalog No. 1064 ....
Intensifying Screen and Cassette — Size 10″ x 12″. Catalog No. 1060 ....
U. S. Army Manual. Catalog No. 1150 ....
Eastman X-Ray Exposure Rule ....
Lead Lined Box for films and plates of all sizes. Catalog No. 1083 ....
Dark Room Supplies, Films, Plates, etc. (See price list).

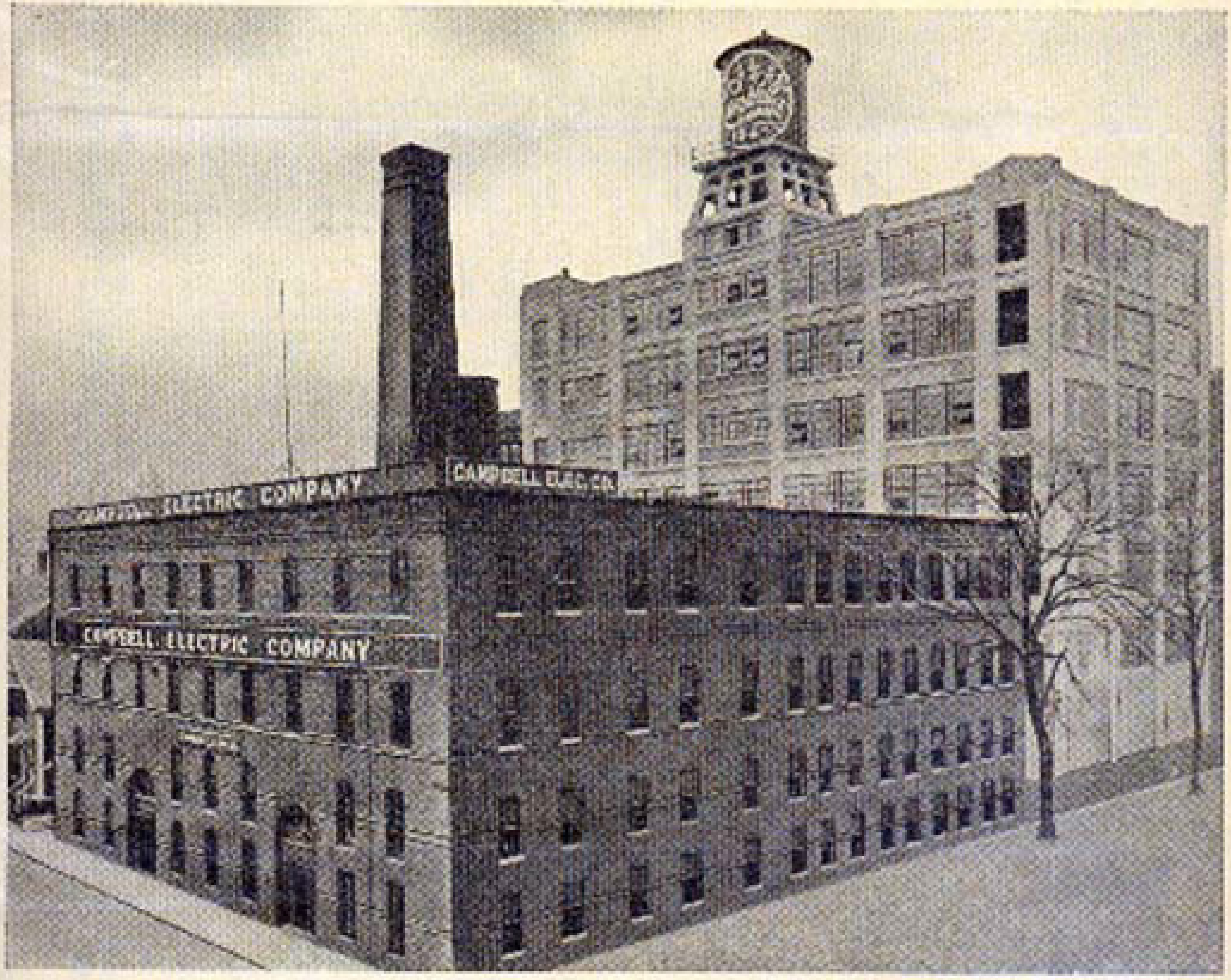
PHONE, POPLAR 9846
K. MELVILLE HANSCOM
EASTERN PENNSYLVANIA DISTRIBUTOR
1512 GREEN ST., PHILADELPHIA, PA.

Campbell
Electric Co.
Lynn, Mass

PRICES IN EFFECT APRIL 1, 1920

Which supersede prices listed in all catalogues
issued to date and made necessary to
PRESERVE QUALITY

6612


CAMPBELL ELECTRIC COMPANY
CAMPBELL ELEC. CO.
CAMPBELL ELECTRIC COMPANY

"The Plant That Serves You"

CAMPBELL ELECTRIC COMPANY
LYNN, MASSACHUSETTS

Campbell
Electric Co.
Lynn, Mass

3702

PRICES IN EFFECT SEPTEMBER 1, 1920

Which supersede prices listed in all catalogues
issued to date and made necessary to
PRESERVE QUALITY

CAMPBELL ELECTRIC COMPANY
CAMPBELL ELEC. CO.
CAMPBELL ELECTRIC COMPANY

"The Plant That Serves You"

CAMPBELL ELECTRIC COMPANY

LYNN, MASSACHUSETTS

PHONE, POPLAR 5846
K. MELVILLE HANSCOM
EASTERN PENNSYLVANIA DISTRIBUTOR
1512 GREEN ST., PHILADELPHIA, PA.

Campbell

Prices in Effect September 1, 1920

ALPHABETICAL LIST

Cat. No.		Prices
1076	Aerial System (Overhead Trolley), consisting of 2 Wall Boards, 3 Wall Insulators with Turnbuckles, 3 Wall Insulators without Turnbuckles, 80 feet Trolley Wire, 1 Trolley Reel with Wheels, and 1 Coolidge Tube Reel	$ 50.00
	Individual Parts. (For Aerial System.)	
1067	Wall Insulator (Strain) without Turnbuckle	4.00
1068	Wall Board	3.00
1069	Wall Insulator (Strain) with Turnbuckle	4.50
1070	Trolley Wire, per foot	.05
1071	9 feet Cord Reel, with Wheels	6.00
1072	Trolley Wheel	3.00
1073	Coolidge Tube Reel, with Trolley Wheels	10.00
1074	2 foot H. T. Insulator Tubes for Connecting Rooms	7.50
1075	Aerial H. T. Switch, complete	40.00
2045	Ammeter, for Coolidge Filament Transformer	30.00
2012	Angle Indicator	7.00
1090	Apron, X-ray Protective	15.00
1150	Army (U. S.) Manual	4.00
1583	Atomizer	3.50
1528	Auto Condensation Pad, with Cords	20.00
1007	Auto Condensation Chair, with Leg Section (Head Section $15 extra)	85.00
	Bedside Units, See Coolidge Clinical and Clinette Units.	
2062	Benoist Penetrometer	4.00
1512	Cabinet for Model "E" Coil or Clinette Portable Coolidge Unit	30.00
1574	Cautery, Blade only	2.00
1573	Cautery, Handle and Blade	6.50
1053	Cassette, 5 x 7 (For Intensifying Screen)	12.00
1054	Cassette, 8 x 10 (For Intensifying Screen)	15.00
1055	Cassette, 10 x 12 (For Intensifying Screen)	18.50
1056	Cassette, 11 x 14 (For Intensifying Screen)	22.00
1057	Cassette, 14 x 17 (For Intensifying Screen)	24.00
2097	Centering Rod for No. 6 Tube Stand	7.50
1007	Chair, Auto Condensation, with Leg Section (Head Section $15 extra)	85.00
	Chemicals (Photographic). (See Dark Room Supplies.)	
	"Clinix"—Self-Excited—Tube-Tilt Table—See Tables.	
	Coils	
2084	Coolidge Clinical Metal Cabinet Type, 3, 4 and 5" Gap, 0 to 30 M/A, A. C.	680.00
1592	Coolidge Clinette BEDSIDE, Portable Type, 0 to 30 milliamperes, 3" to 5" Spark Gap, Rheostat Control (Single Unit), A. C.	540.00
1593	Separate Auto Transformer Control for Clinette Portable Coil (Double Unit)	100.00
1200	Coolidge DENTAL, Cabinet Type, A. C., 60 Cycle	600.00
1511	Model "H", A. C., 50 to 60 Cycle	150.00
1509	Model "E", A. C., 50 to 60 Cycle	300.00
1504	Model "I", A. C., 50 to 60 Cycle	500.00
1505	Model "I", A. C., 50 to 60 Cycle with Pump	650.00
	Cones	
1020	No. 5A	14.00
1021	No. 5B	17.00
1016	No. 6A	14.00
1017	No. 6B	17.00
1018	No. 6C	14.00
1019	No. 6D	14.00
1518	No. 12A	10.00
1519	No. 12B	10.00
	Coolidge Tubes	
1022	Fine Focus	125.00
1023	Medium Focus	125.00
1024	Broad Focus	125.00
1270	Bedside, Radiator Type (Indicate whether 10 or 30 m/a)	125.00
1029	Dental, Radiator Type	125.00

Campbell

ALPHABETICAL LIST

1025	Coolidge Tube Filament Transformer with Control, A. C. (Specify Voltage)	$85.00
2045	Coolidge Tube Ammeter for above Transformer	30.00
	Coolidge Units—Outfits.	
2084	Clinical Coil, Cabinet Type, Mahogany finish, A. C., 50 to 60 Cycle (Will operate either 10 Milliampere or 30 Milliampere Tube with 3, 4 and 5" Gap.)	680.00
1591	Tube-stand, Counterweighted, Stereoscopic	190.00
1037	Foot Switch, with Cable and Plug	30.00
1269	Tube-shield, Lead Glass	25.00
1270	Coolidge Radiator Bedside Tube	125.00
	Outfit Complete	**1050.00**
2081	Extra for Automatic Time Controller	60.00
	Extra for use on 110 V. D. C., 10 Milliamperes	150.00
1592	Bedside Coil, Clinette Portable Type, 0 to 30 Milliamperes, 3" to 5" Spark Gap, Rheostat Control (Single Unit), A. C., 110 Volt	540.00
1593	Separate Auto Transformer Control for Portable Coil (Double Unit)	100.00
1594	Tube Holder, Adjustable Bracket Type	60.00
1260	Tube-shield, Lead Glass	25.00
1270	Coolidge Radiator Bedside Tube	125.00
	Outfit Complete (Single Unit)	**750.00**
	(Double Unit)	**850.00**
	Extra for Stereoscopic Tube Holder (Catalog No. 2072)	35.00
2082	Extra for Automatic Time Controller	60.00
	Extra for use on 110 V. D. C., 10 Milliamperes	150.00
1200	Dental-Coil, A. C., 50 to 60 Cycle, Wood Cabinet, Mahogany Finish	600.00
2099	Dental-Coil, A. C., 50 to 60 Cycle, Metal Cabinet, Mahogany Finish	600.00
2007	Tube Holder (Adjustable Bracket Type)	60.00
1037	Foot Switch, with Cable and Plug	30.00
2010	Tube-shield, Lead Glass	35.00
1029	Coolidge Radiator Dental Tube	125.00
	Outfit Complete,	**850.00**
	Extra for Stereoscopic Tube Holder (Catalog No. 2071)	35.00
2083	Extra for Automatic Time Controller	60.00
	Extra for use on 110 V. D. C.	100.00
1078	Coolidge Tube Reel	8.00
1073	Coolidge Tube Reel, with Trolley Wheels	10.00
1004	Control Table for No. 12 SureX, instead of switchboard attached, difference extra	200.00
	Cords	
1567	Connecting Cord, with Plugs	3.00
1568	Heavy Cable, with Hook	2.00
1569	Light Cable, with Hook	1.50
1570	Cautery Cords (pair)	1.50
1571	Bifurcated Cord	1.50
1572	Treatment Chair Cord	1.50
	Cord Reels. (See Reels.)	
	Dark Room Supplies	
1110	Developing Tank, stone	75.00
1111	Developing Tank, plate racks, each, 5 x 7	2.00
1112	Developing Tank, plate racks, each, 6½ x 8½	2.00
1113	Developing Tank, plate racks, each, 8 x 10	2.00
1114	Developing Tank, plate racks, each, 10 x 12	2.00
1115	Developing Tank, plate racks, each, 11 x 14	2.50
1116	Developing Tank, plate racks, each, 14 x 17	2.50
1117	Developer, Eastman X-ray, ½ dozen packages (each makes 12 oz.)	.90
1118	Fixing Powder (makes 64 oz.)	.25
1119	Hard Rubber Fixing Box	18.50
1120	Graduate, 8 ounces	.55
1121	Graduate, 16 ounces	.75
1122	Drying Rack	2.50
1123	Mortar and Pestle	.60
1124	Ruby Lamp and Illuminator, 7" x 9" Ruby—5" x 8" White	12.00
1126	Balance Scales	5.00
1127	Thermometer Stirring Rod	1.00
2062	Interval Timer (For Timing Development)	8.00
1128	Trays, 8 x 10	1.50

	Dark Room Su
1129	Trays,
1130	Trays, 1
1131	Trays,
1132	Wash B
	(See
	Dental Units,
2046	Developing Ca
2047	Developing Ca
2085	Developing Fra
	Developing Tan
1575	Diagnostic Lam
1576	Diagnostic Lam
2098	Dosage Indicat
1122	Drying Rack
	Dupli-Tized Fil
	Electrodes, (G
1530	Plain Electro
1531	Surface
1532	Vaginal
1533	Rectal E
1534	Urethral
1535	Nasal El
1536	Throat E
1537	Electrode
2096	Blackmar
2015	Dental Electr
2016	Dental S
2017	Dental C
2018	Dental G
2019	Dental P
2020	Dental C
2021	Dental H
	Insulated and
1538	Insulated
1539	Insulated
1540	Insulated
1541	Insulated
1542	Insulated
1543	Insulated
1544	Goitre El
1545	Single Ey
1546	Double E
1547	Cataphori
1548	Condense
1549	Block Tin
1550	Treatmen
1551	Treatmen
1552	Fulgurati
1553	Moist Ele
1554	Moist Ele
1555	Metal Ha
1565	Morse M
	Non-Vacu
	Envelopes (for fi
1586	Eustachian Tube
2100	Exposure Holder
2101	Exposure Holder
2102	Exposure Holder
2103	Exposure Holder
2104	Exposure Holder
2105	Exposure Holder
	Films, Dental.
1105	1¼" x 1¾",
1106	1¼" x 2¼",
1107	2¼" x 3",

:) $85.00
.... 30.00

cle ... 680.00
3, 4

.... 190.00
.... 30.00
.... 25.00
.... 125.00
.......**1050.00**
.... 60.00
.... 150.00
Spark
.... 540.00
) 100.00
.... 60.00
.... 25.00
.... 125.00
.... **750.00**
.... **850.00**
.... 35.00
.... 60.00
.... 150.00

h 600.00
t 600.00
.... 60.00
.... 30.00
.... 35.00
.... 125.00
.... **850.00**
.... 35.00
.... 60.00
.... 100.00

.... 8.00
.... 10.00
e extra 200.00

.... 3.00
.... 2.00
.... 1.50
.... 1.50
.... 1.50
.... 1.50

.... 75.00
.... 2.00
.... 2.00
.... 2.00
.... 2.00
.... 2.50
.... 2.50
.... .90
.... .25
.... 18.50
.... .55
.... .75
.... 2.50
.... .60
.... 12.00
.... 5.00
.... 1.00
.... 8.00
.... 1.50

ALPHABETICAL LIST

	Dark Room Supplies	
1129	Trays, 10 x 12	$3.00
1130	Trays, 11 x 14	4.00
1131	Trays, 14 x 17	6.00
1132	Wash Box to hold 14 x 17 Plates	12.00
	(See Films and Plates.)	
	Dental Units, see Coolidge Units	
2046	Developing Cabinet (Portable Dark Room)	45.00
2047	Developing Cabinet, with Trays, Films and Chemicals	50.00
2085	Developing Frame for Eastman Dupli-Tized Films, each	1.50
	Developing Tanks, Developer, etc. (See Dark Room Supplies.)	
1575	Diagnostic Lamp in holder	2.50
1576	Diagnostic Lamp Bulb	.50
2098	Dosage Indicator, Grover's X-ray	3.00
1122	Drying Rack	3.00
	Dupli-Tized Films, Eastman, see Films	
	Electrodes. (Glass Vacuum.)	
1530	Plain Electrodes (set with handle)	10.00
1531	Surface Electrode	1.50
1532	Vaginal Electrode	1.50
1533	Rectal Electrode	1.50
1534	Urethral Electrode	1.50
1535	Nasal Electrode	1.50
1536	Throat Electrode	1.50
1537	Electrode Handle	2.00
2096	Blackman Hand Electrode	5.00
2015	Dental Electrodes (set with handle)	12.00
2016	Dental Surface Electrode	1.75
2017	Dental Cavity or Pulp Tester	1.75
2018	Dental Gum	1.75
2019	Dental Pyorrhea	1.75
2020	Dental Cataphoric	1.75
2021	Dental Handle, with Cord	3.50
	Insulated and Miscellaneous Electrodes	
1538	Insulated Vaginal	2.50
1539	Insulated Rectal	2.00
1540	Insulated Urethral	2.00
1541	Insulated Nasal	2.00
1542	Insulated Throat	2.00
1543	Insulated Ear	2.00
1544	Goitre Electrode	2.50
1545	Single Eye Electrode	1.50
1546	Double Eye Electrode	2.00
1547	Cataphoric Electrode	4.00
1548	Condenser	4.00
1549	Block Tin Electrode	.75
1550	Treatment Chair, Vacuum Electrode, each	.75
1551	Treatment Chair, Hand Electrode, each	1.00
1552	Fulguration Electrode Handle, with 2 Electrodes (Extra Electrode 25 cents)	3.50
1553	Moist Electrode, large	3.00
1554	Moist Electrode, small	2.50
1555	Metal Hand Electrode (pair)	.75
1565	Morse Moist Pads (set)	10.00
	Non-Vacuum Electrodes, any kind, each	7.50
	Envelopes (for filing plates) see Plate Containers	
1586	Eustachian Tube Inflator	.50
2100	Exposure Holders for Dupli-Tized Films, 5 x 7 each	.08
2101	Exposure Holders for Dupli-Tized Films, 6½ x 8½ each	.10
2102	Exposure Holders for Dupli-Tized Films, 8 x 10 each	.10
2103	Exposure Holders for Dupli-Tized Films, 10 x 12 each	.15
2104	Exposure Holders for Dupli-Tized Films, 11 x 14 each	.15
2105	Exposure Holders for Dupli-Tized Films, 14 x 17 each	.20
	Films, Dental.	
1105	1¼" x 1¾", per dozen	.50
1106	1¼" x 2¼", per dozen	.85
1107	2¼" x 3", per dozen	1.75

Campbell

ALPHABETICAL LIST

No.	Item	Price
	Films, Eastman Dupli-Tized.	
2064	Size 5" x 7" with envelopes, per doz.	$1.25
2065	Size 6½" x 8½" with envelopes, per doz.	2.00
2066	Size 8" x 10" with envelopes, per doz.	2.85
2067	Size 10" x 12" with envelopes, per doz.	4.50
2068	Size 11" x 14" with envelopes, per doz.	5.55
2069	Size 14" x 17" with envelopes, per doz.	8.75
	→ See price list Exposure Holders (for use with films)	
2043	Film Chest, Dental Lead	12.00
1140	Film Clamps, for developing, per dozen	2.50
1141	Film Holders, for Dental Radiography, each	.75
	Film Holders, Exposure for Dupli-Tized Films, see Exposure Holders	
2044	Film Illuminator, Dental	7.50
1108	Film Mounts, cardboard, per hundred	4.50
1109	Film Mounts, transparent, per hundred	5.50
	Filters, aluminum	
1079	1 mm.	1.00
1080	2 mm.	1.50
1081	3 mm.	2.00
1118	Fixing Powder (make 64 oz.)	.25
	Fluoroscope	
1522	5 x 7, Folding	35.00
1039	8 x 10, not Folding	50.00
	Fluoroscope Screens	
1040	8 x 10	35.00
1041	10 x 12	52.00
1042	11 x 14	72.00
1043	14 x 17	102.00
	Fluoroscope Screen mounted in Oak Frame, with lead glass.	
1044	8 x 10	52.00
1045	10 x 12	75.00
1046	11 x 14	95.00
1047	14 x 17	135.00
	Fluoroscopy—Vertical, Horizontal, Angular. (See Tables.)	
2060	Foil. Lead, for X-ray Protection in Treatment, per lb.	.50
1036	Foot Switch, heavy capacity, double contact, to control lamp	45.00
1037	Foot Switch, heavy capacity, single contact	30.00
1091	Gloves, opaque protective (plain)	12.00
1092	Gloves, opaque protective (gauntlet)	15.00
1120	Graduate, 8 ounces	.55
1121	Graduate, 16 ounces	.75
2098	Grover's X-ray Dose Indicator	3.00
1119	Hard Rubber Fixing Box	18.50
2093	High Tension Transformer for No. 6 Tube Stand with Clinix	450.00
	Holders, Exposure for Dupli-Tized Films, see Exposure Holders.	
1035	Illuminator, Negative (with Nitrogen Lamps and Dimmers)	60.00
1124	Illuminator and Ruby Lamp combined, for up to 8 x 10 Plates	12.00
2098	Indicator, X-ray Dose, Grover's	3.00
2022	Instruments, Switchboard (set) with handle	35.00
2023	Mouth Lamp	4.50
2024	Antrum Lamp	4.50
2025	Root Canal Drier	4.50
2026	Gutta-Percha Excavator	4.50
2027	Cautery	4.50
2028	Canal Drier Needles, Fine	1.50
2029	Canal Drier Needles, Medium	1.50
2030	Canal Drier Needles, Coarse	1.50
2031	Wax Spatula	3.25
1069	Insulators, wall (Strain, for Trolley System), with Turnbuckle	4.50
1074	Insulator 2 foot H. T. for Connecting Rooms	7.50

5x7" 35

.10

3,5

No.	Item
	Intensi
1048	
1049	
1050	
1051	
1052	
	Intensi
2088	
2089	
2090	
2091	
2092	
	Intensi
1058	
1059	
1060	
1061	
1062	
2062	Interva
1060	Lead F
1061	Lead G
1090	Lead P
1091	Lead P
1092	Lead P
1012	Lead P
1011	Lead P
1150	Manual
1008	Milam
1529	Milam
1564	Morse
1565	Morse
1123	Mortar
1107	Mount
1108	Mount
1582	Nebuli
	Negati
	Overhe
1556	Ozone
1134	Pastille
2063	Penetro
	Photog
1587	Pilot L
	Plates,
1093	
1094	
1095	
1096	
1097	
1098	
1099	
1100	
1101	
1102	
1103	
1104	
	Plate C
2049	
2050	
2051	
2052	
2053	
2054	

$1.25
2.00
2.85
4.50
5.55
8.75

12.00
2.50
.75

7.50

4.50
5.50

1.00
1.50
2.00

.25

35.00
50.00

35.00
52.00
72.00
102.00

52.00
75.00
95.00
135.00

.50
45.00
30.00

12.00
15.00
.55
.75
3.00
18.50
450.00

60.00
12.00

3.00
35.00
4.50
4.50
4.50
4.50
4.50
1.50
1.50
1.50
3.25

4.50
7.50

3x7" = 35 sq in
@ .10 per sq in
3.50

11x14" screen

22.00
40.00
62.00

Campbell

ALPHABETICAL LIST

	Intensifying Screens (Single).	
1048	5 x 7	$10.00
1049	8 x 10	20.00
1050	10 x 12	30.00
1051	11 x 14	40.00
1052	14 x 17	60.00
	Intensifying Screens (Double). Combination, for use with Dupli-Tized Films.	
2088	5 x 7 (The pair)	15.00
2089	8 x 10 " "	32.50
2090	10 x 12 " "	50.00
2091	11 x 14 " "	65.00
2092	14 x 17 " "	100.00
	(For Cassette prices, see Catalog Numbers 1053 to 1057, inclusive.)	
	Intensifying Screens (Single), with Cassettes	
1058	5 x 7	22.00
1059	8 x 10	35.00
1060	10 x 12	48.50
1061	11 x 14	62.00
1062	14 x 17	84.00
2062	Interval Timer	8.00
1060	Lead Foil. For Protection in X-ray Treatment, per lb.	.50
1061	Lead Glass. Protective, Regular Plate Sizes, per square inch	.10
1090	Lead Protective Rubber Apron	15.00
1091	Lead Protective Gloves (plain)	12.00
1092	Lead Protective Gloves (gauntlet)	15.00
1012	Lead Protective Screen, Hinged to Cabinet of SureX Transformer	90.00
1011	Lead Protective Screen, separate	90.00
1150	Manual, U. S. Army	4.00
1008	Milammeter for SureX, 8-inch diameter, 0-15—0-150M/A	60.00
1529	Milammeter with Bracket, for H. F. current	35.00
1564	Morse Sine Wave Generator	300.00
1565	Morse Moist Electrodes (set)	10.00
1123	Mortar and Pestle	1.00
1107	Mounts for Dental Films, Cardboard, double film per 100	5.50
1108	Mounts for Dental Films, Cardboard, single film per 100	4.50
1582	Nebulizer	3.00
	Negative preservers, see Plate Containers	
	Overhead Trolley System. (See Aerial System.)	
1556	Ozone Generator	20.00
1134	Pastilles, Sabouraud, 25 cents each	.25
2063	Penetrometer (Benoist)	4.00
	Photographic Supplies. (See Dark Room Supplies.)	
1587	Pilot Lamp Bulb	.50
	Plates, X-ray	
1093	5 x 7 Seed X-ray plates, with envelopes, per dozen	1.70
1094	6½ x 8½ Seed X-ray plates, with envelopes, per dozen	2.55
1095	8 x 10 Seed X-ray plates, with envelopes, per dozen	3.60
1096	10 x 12 Seed X-ray plates, with envelopes, per dozen	6.10
1097	11 x 14 Seed X-ray plates, with envelopes, per dozen	8.50
1098	14 x 17 Seed X-ray plates, with envelopes, per dozen	13.50
1099	5 x 7 Seed X-ray plates, without envelopes, per dozen.	1.40
1100	6½ x 8½ Seed X-ray plates, without envelopes, per dozen.	2.10
1101	8 x 10 Seed X-ray plates, without envelopes, per dozen.	3.00
1102	10 x 12 Seed X-ray plates, without envelopes, per dozen.	5.15
1103	11 x 14 Seed X-ray plates, without envelopes, per dozen.	7.25
1104	14 x 17 Seed X-ray plates, without envelopes, per dozen.	11.25
	Plate Containers. (Negative Preservers) for Filing.	
2049	5 x 7 per 100	.35
2050	6½ x 8½ per 100	.60
2051	8 x 10 per 100	.65
2052	10 x 12 per 100	1.30
2053	11 x 14 per 100	1.80
2054	14 x 17 per 100	2.25

ALPHABETICAL LIST

1083	Plate Box, lead lined	$45.00
1063	Plate Changing Tunnel, 10 x 10	14.50
1064	Plate Changing Tunnel, 12 x 12	19.50
1065	Plate Changing Tunnel, 14 x 14	24.00
1066	Plate Changing Tunnel, 17 x 17	30.00
1088	Plate Marker	6.00
1584	Powder Blower	3.00
1012	Protective Screen, hinged to cabinet of SureX Transformer	90.00
1011	Protective Screen, separate	90.00
1524	Pump, compressed air and vacuum	150.00
1089	Radiometer, Hampson	18.00
	Reels	
1566	6 feet Cord Reel	3.00
1077	9 feet Cord Reel	4.00
1071	9 feet Cord Reel, with Wheels	6.00
1078	Coolidge Tube Reel	8.00
1073	Coolidge Tube Reel, with Wheels	10.00
	Rebuild X-ray Tube, 5", 6" or 7"	35.00
	Re-exhaust X-ray Tubes, 5", 6" or 7"	10.00
1560	Rotary Converter with step-up transformer, 6 ampere, 110 Volt D. C.	150.00
1561	Rotary Converter without step-up transformer, 6 ampere, 110 Volt D. C.	100.00
1562	Rotary Converter with step-up transformer, 12 ampere, 110 Volt D. C.	200.00
1563	Rotary Converter without step-up transformer, 12 ampere, 110 Volt D. C.	150.00
1578	Rotating Spark Gap Plate	10.00
1006	Rubber, X-ray Protective, per sq. ft.	3.00
1090	Rubber Apron, Lead Protective	15.00
1124	Ruby Lamp and Illuminator, CAMPBELL combination, for up to 8 x 10 plates	12.00
1134	Sabouraud Pastilles, each	.25
	Scales (see Dark Room Supplies).	
	Screens, Fluoroscopic (see Fluoroscopic screens).	
	Screens, Intensifying (see Intensifying screens).	
1577	Spark Gap Tips, for E Coil (each)	2.00
1585	Shut-off for bottles	2.50
1082	Sinus Head Block	6.00
	Stands. (See Tube-stands.)	
1034	Stereoscope, with Nitrogen Lamps and Dimmers	175.00
	"SureX" Interrupterless Transformer	
1000	No. 12 A. C., 220V., 60 Cycle (or 110 Volt, if ordered) Switchboard attached	1650.00
1001	No. 12 D. C., 220V., (or 110 Volt, if ordered) Switchboard attached	1950.00
1002	No. 2 A. C., 220 V., 60 Cycle, Switchboard attached, (Army Type)	1550.00
1004	Separate Control Table instead Switchboard attached, difference extra	200.00
1075	Switch, High Tension Aerial	40.00
	Switchboard Instruments. (See Instruments.)	
	Tables—"Clinix"—Self-Excited—Tube Tilt—Motor Driven—Auto Control.	
2086	Clinix Tube-tilt Table without Stand, with 11 x 14 Screen, Automatic Screen Attachment, Motor Drive, Auto Control	2200.00
2087	Clinix Tube-tilt Table, No. 6 Tube-stand, 11 x 14 Fluoroscope Screen, Automatic Screen Attachment, Motor Drive, Auto Control, complete	2500.00
2094	Clinix Tube Tilt Table without Stand, High Tension Transformer or Control, with 11 x 14 Screen	1650.00
2095	Clinix Tube Tilt Table without Stand, Motor, High Tension Transformer or Control, with 11 x 14 Screen	1550.00
2093	Clinix Tube Stand Transformer, for No. 6 Tube Stand	450.00
	Tanks, see Dark Room Supplies.	
1127	Thermometer Stirring Rod	1.00
1009	Time Controller	60.00

1010	Time Contr
2081	Time Contr
2082	Time Contr
2083	Time Contr
2093	Transformer
	Transformer
	Transformer
	Transformer
1128	Trays, 8 x
1129	Trays, 10 x
1130	Trays, 11 x
1131	Trays, 14 x
1007	Treatment C
	Trolley Syst
1076	Trolley Whe
1071	Trolley Reel
1070	Trolley Wir
	Tubes
1022	Tube,
1023	Tube,
1024	Tube,
1029	Tube,
1270	Tube
1027	Tube,
1028	Tube,
	Tube
	Tube,
	Tube-rack
1084	1 Uni
1085	2 Uni
1086	4 Uni
1087	6 Uni
2011	Tube-shield,
1523	Tube-shield,
2010	Tube-shield,
1260	Tube-shield,
	Tube-stands
1517	Wooc
1516	Wood
2007	Cooli
2106	Cooli
2071	Cooli
1594	Cooli
2072	Cooli
1591	Cooli
1515	No. 1
1013	No. 6
	(Cent
	Units. (Se
1579	Vacuum Cu
1580	Vacuum Cu
1581	Vacuum Cu
1035	View Box (I
1068	Wall Board
1067	Wall Insulat
1132	Wash Box t
1070	Wire for Tr
2098	X-ray Dose

$45.00

14.50
19.50
24.00
30.00
6.00
3.00
90.00
90.00
150.00
18.00

3.00
4.00
6.00
8.00
10.00

35.00
10.00

150.00
C. 100.00
200.00
C. 150.00

10.00
3.00

15.00
10 plates . 12.00
.25

2.00
2.50
6.00

175.00

d attached 1650.00
ched 1950.00
pe) 1550.00
e extra ... 200.00
40.00

o Control.
tic Screen
2200.00
en, Auto-
2500.00

Control,
1650.00
former or
1550.00
450.00

1.00
60.00

Campbell

ALPHABETICAL LIST

1010	Time Controller, with switch mounted on separate panel	$75.00
2081	Time Controller for Coolidge Bedside Unit Cabinet Type	60.00
2082	Time Controller for Coolidge Bedside Unit Portable Type	60.00
2083	Time Controller for Coolidge Dental Unit	60.00
2093	Transformer, Extra High Tension, for No. 6 Tube Stand, with Clinix	450.00
	Transformer—Coolidge, see Coolidge Transformers and Units.	
	Transformers—Interrupterless, see SureX Transformers.	
	Transformers for Clinix, see Tables Clinix	
1128	Trays, 8 x 10	1.50
1129	Trays, 10 x 12	3.00
1130	Trays, 11 x 14	4.00
1131	Trays, 14 x 17	6.00
1007	Treatment Chair (Auto-Condensation), with Leg Section (Head Section $15 extra)	85.00
	Trolley System, see Aerial System.	
1076	Trolley Wheels	3.00
1071	Trolley Reels, with Wheels, 9 feet	6.00
1070	Trolley Wire, per foot	.05
	Tubes	
1022	Tube, Coolidge, fine focus, 7"	125.00
1023	Tube, Coolidge, medium focus, 7"	125.00
1024	Tube, Coolidge, broad focus, 7"	125.00
1029	Tube, Coolidge Dental, Radiator Type	125.00
1270	Tube, Coolidge Bedside, Radiator Type (Indicate whether 10 or 30 M/A)	125.00
1027	Tube, 6" Tungsten Target (High-Frequency)	45.00
1028	Tube, 7" Heavy Tungsten Target (Transformer)	50.00
	Tube Rebuild, using old Tungsten Target 5", 6" or 7"	35.00
	Tube, Re-exhaust 5", 6" or 7"	10.00
	Tube-rack	
1084	1 Unit	3.50
1085	2 Unit	5.00
1086	4 Unit	7.50
1087	6 Unit	10.50
2011	Tube-shield, leaded rubber 5"	15.00
1523	Tube-shield, leaded rubber 6"	15.00
2010	Tube-shield, for Coolidge Dental Tube, Lead Glass	35.00
1260	Tube-shield, for Coolidge Bedside Tube, Lead Glass	25.00
	Tube-stands	
1517	Wood, portable	6.00
1516	Wood Floor Stand	15.00
2007	Coolidge Dental Tube Holder (Bracket Type) (Regular)	60.00
2106	Coolidge Tube Holder, Dental Engine Type, Long Range	110.00
2071	Coolidge Dental Tube Holder, Bracket Type (Stereoscopic)	95.00
1594	Coolidge Bedside Portable Tube Holder (Bracket Type) (Regular)	60.00
2072	Coolidge Bedside Portable Tube Holder (Bracket Type) (Stereoscopic)	95.00
1591	Coolidge Bedside, Counterweighted, Stereoscopic	190.00
1515	No. 12 Tube Stand	180.00
1013	No. 6 Stereoscopic Tube Stand with Diaphragm	300.00
	(Centering Rod, Catalog No. 2007, $7.50—See price list CONES).	
	Units. (See Coolidge Units.)	
1579	Vacuum Cups, small	1.50
1580	Vacuum Cups, medium	1.50
1581	Vacuum Cups, large	1.50
1035	View Box (Plate Illuminator), Size 17" x 17" with Nitrogen Lamps and Dimmer	60.00
1068	Wall Board	3.00
1067	Wall Insulator (Strain) without Turnbuckle	4.00
1132	Wash Box to hold 14 x 17 Plates	12.00
1070	Wire for Trolley System, per ft.	.05
2098	X-ray Dose Indicator, Grover's	3.00

NUMERICAL PRICE LIST

September 1, 1920

Cat. No.		Price
	"SureX" Interrupterless Transformer	
1000	No. 12 A. C., 220V., 60 Cycle (or 110V., if ordered) Switchboard attached	$1650.00
1001	No. 12 D. C., 220 V., (or 110V., if ordered) Switchboard attached	1950.00
1002	No. 2 A. C., (Army Type) Switchboard attached	1550.00
1004	Separate Control Table for No. 12 SureX, instead of Switchboard attached, Difference Extra	200.00
1006	Rubber, X-ray Protective, per sq. ft.	3.00
1007	Auto Condensation Chair (with Leg Section) (Head Section $15 extra)	85.00
1008	Milammeter for SureX, 8-inch diameter, 0-15—0-50 M/A.	60.00
1009	Time Controller	60.00
1010	Time Controller, with switch mounted on separate panel	75.00
1011	Protective Screen, separate	90.00
1012	Protective Screen, hinged to cabinet of SureX Transformer	90.00
1013	No. 6 Stereoscopic Tube-stand, with diaphragm	300.00
	(Centering Rod, Catalog No. 2007, $7.50—see price list CONES)	
	Cones	
1016	No. 6A	14.00
1017	No. 6B	17.00
1018	No. 6C	14.00
1019	No. 6D	14.00
1020	No. 5A	14.00
1021	No. 5B	17.00
	Coolidge Tubes	
1022	Fine Focus, 7″	125.00
1023	Medium Focus, 7″	125.00
1024	Broad Focus, 7″	125.00
1025	Coolidge Tube Filament Transformer, with Control, A. C. (specify voltage)	85.00
1027	Tube, 6″ Tungsten Target (High-Frequency)	45.00
1028	Tube, 7″ Heavy Tungsten Target (Transformer)	50.00
1029	Dental Tube, Radiator Type	125.00
1034	Stereoscope with Nitrogen Lamps and Dimmers	175.00
1035	Illuminator, Negative (with Nitrogen Lamps and Dimmers)	60.00
1036	Foot Switch, heavy capacity, double contact, to control lamp	45.00
1037	Foot Switch, heavy capacity, single contact, with Cable and Plug	30.00
	Fluoroscope	
1039	8 x 10, not Folding	50.00
	Fluoroscope Screens	
1040	8 x 10	35.00
1041	10 x 12	52.00
1042	11 x 14	72.00
1043	14 x 17	102.00
	Fluoroscope Screen mounted in Oak Frame, with Lead Glass	
1044	8 x 10	52.00
1045	10 x 12	65.00
1046	11 x 14	95.00
1047	14 x 17	135.00
	Fluoroscopy, Vertical, Horizontal, Angular (see Tables).	
	Intensifying Screens (Single).	
1048	5 x 7	10.00
1049	8 x 10	20.00
1050	10 x 12	30.00
1051	11 x 14	40.00
1052	14 x 17	60.00

1053	Cassettes 5
1054	Cassettes 8
1055	Cassettes 10
1056	Cassettes 11
1057	Cassettes 14
	Intensifying
1058	5 x
1059	8 x
1060	10 x
1061	11 x
1062	14 x
1063	Plate Chang
1064	Plate Chang
1065	Plate Chang
1066	Plate Chang
	Individual
1067	Wall
1068	Wall
1069	Wall
1070	Troll
1071	9 feet
1072	Troll
1073	Cooli
1074	2 foot
1075	Aeria
1076	Aerial Syste
	Consisti
	Insul
	with
1077	9 feet
1078	Cooli
	Filters, alur
1079	1 mm
1080	2 mm
1081	3 mm
1082	Sinus Head
1083	Plate Box, l
	Tube-rack
1084	1 Uni
1085	2 Uni
1086	4 Uni
1087	6 Uni
1088	Plate Marke
1089	Radiometer,
1090	Apron, X-ra
1091	Gloves, opac
1092	Gloves, opac
	Plates, X-ra
1093	5 x
1094	6½ x 8
1095	8 x 1
1096	10 x 1
1097	11 x 1
1098	14 x 1
1099	5 x
1100	6½ x 8
1101	8 x 1
1102	10 x 1
1103	11 x 1
1104	14 x 1
	Films, Dent
1105	½″ x
1106	1½″ x
1107	2½″ x
1108	Film Mount
1109	Film Mount

NUMERICAL LIST

1053	Cassettes 5 x 7 (for Intensifying Screens)	$ 12.00
1054	Cassettes 8 x 10 (for Intensifying Screens)	15.00
1055	Cassettes 10 x 12 (for Intensifying Screens)	18.50
1056	Cassettes 11 x 14 (for Intensifying Screens)	22.00
1057	Cassettes 14 x 17 (for Intensifying Screens)	24.00
	Intensifying Screens (Single), with Cassettes	
1058	5 x 7	22.00
1059	8 x 10	35.00
1060	10 x 12	48.50
1061	11 x 14	62.00
1062	14 x 17	84.00
1063	Plate Changing Tunnels, 10 x 10	14.50
1064	Plate Changing Tunnels, 12 x 12	19.50
1065	Plate Changing Tunnels, 14 x 14	24.00
1066	Plate Changing Tunnels, 17 x 17	30.00
	Individual Parts	
1067	Wall Insulator (Strain) without Turnbuckle	4.00
1068	Wall Board	3.00
1069	Wall Insulator (Strain, for Trolley System) with Turnbuckle	4.50
1070	Trolley Wire, per foot	.05
1071	9 feet Cord Reel, with Wheels	6.00
1072	Trolley Wheel	3.00
1073	Coolidge Tube Reel, with Trolley Wheels	10.00
1074	2 foot H. T. Insulator Tubes for Connecting Rooms	7.50
1075	Aerial H. T. Switch, complete	40.00
1076	Aerial System (standard) Consisting of 2 Wall Boards, 3 Wall Insulators, with Turnbuckles, 3 Wall Insulators, without Turnbuckles, 80 feet Trolley Wire, 1 Trolley Reel, with Wheels, 1 Coolidge Tube Reel	50.00
1077	9 feet Cord Reel	4.00
1078	Coolidge Tube Reel	8.00
	Filters, aluminum	
1079	1 mm.	1.00
1080	2 mm.	1.50
1081	3 mm.	2.00
1082	Sinus Head Block	6.00
1083	Plate Box, lead lined	45.00
	Tube-rack	
1084	1 Unit	3.50
1085	2 Unit	5.00
1086	4 Unit	7.50
1087	6 Unit	10.50
1088	Plate Marker	6.00
1089	Radiometer, Hampson	18.00
1090	Apron, X-ray Protective	15.00
1091	Gloves, opaque protective (plain)	12.00
1092	Gloves, opaque protective (gauntlet)	15.00
	Plates, X-ray	
1093	5 x 7 Seed X-ray Plates, with envelopes, per dozen	1.70
1094	6½ x 8½ Seed X-ray Plates, with envelopes, per dozen	2.55
1095	8 x 10 Seed X-ray Plates, with envelopes, per dozen	3.00
1096	10 x 12 Seed X-ray Plates, with envelopes, per dozen	6.10
1097	11 x 14 Seed X-ray Plates, with envelopes, per dozen	8.50
1098	14 x 17 Seed X-ray Plates, with envelopes, per dozen	13.50
1099	5 x 7 Seed X-ray Plates, without envelopes, per dozen	1.40
1100	6½ x 8½ Seed X-ray Plates, without envelopes, per dozen	2.10
1101	8 x 10 Seed X-ray Plates, without envelopes, per dozen	3.00
1102	10 x 12 Seed X-ray Plates, without envelopes, per dozen	5.15
1103	11 x 14 Seed X-ray Plates, without envelopes, per dozen	7.25
1104	14 x 17 Seed X-ray Plates, without envelopes, per dozen	11.25
	Films, Dental	
1105	⅞" x 1⅝", per dozen	.50
1106	1¼" x 2¼", per dozen	.85
1107	2¼" x 3", per dozen	1.75
1108	Film Mounts, cardboard, per hundred	4.50
1109	Film Mounts, transparent, per hundred	5.50

NUMERICAL LIST

	Dark Room Supplies	
1110	Developing Tank, stone	$ 75.00
1111	Developing Tank, plate racks, each, 5 x 7	2.00
1112	Developing Tank, plate racks, each, 6½ x 8½	2.00
1113	Developing Tank, plate racks, each, 8 x 10	2.00
1114	Developing Tank, plate racks, each, 10 x 12	2.00
1115	Developing Tank, plate racks, each, 11 x 14	2.50
1116	Developing Tank, plate racks, each, 14 x 17	2.50
1117	Developer, Eastman X-ray, ½ dozen packages (each package makes 12 oz.)	.90
1118	Fixing Powder (makes 64 oz.)	.25
1119	Hard Rubber Fixing Box	18.50
1120	Graduate, 8 ounces	.55
1121	Graduate, 16 ounces	.75
1122	Drying Rack	3.00
1123	Mortar and Pestle	2.50
1124	Ruby Lamp and Illuminator, CAMPBELL combination. For up to 8 x 10 Plates	12.00
1126	Balance Scales	5.00
1127	Thermometer Stirring Rod	1.00
1128	Trays, 8 x 10	1.50
1129	Trays, 10 x 12	3.00
1130	Trays, 11 x 14	4.00
1131	Trays, 14 x 17	6.00
1132	Wash Box to hold 14 x 17 Plates	12.00
1134	Sabouraud Pastilles, each	.25
1140	Film Clamps. For developing, per dozen	2.50
1141	Film Holders. For dental radiography, each	.75
1150	Army (U. S.) Manual	4.00
1200	Dental Coil (Coolidge Dental Unit), A. C., 50 to 60 Cycle, Mahogany finish	600.00
1260	Bedside Tube-shield, Lead Glass	25.00
1270	Coolidge Radiator Bedside Tube	125.00
1504	Model "I", High Frequency Coil, A. C., 50 to 60 Cycle	500.00
1505	Model "I", High Frequency Coil, with Pump, A. C., 50 to 60 Cycle	650.00
1509	Model "E", High Frequency Coil, A. C., 50 to 60 Cycle	300.00
1511	Model "H", High Frequency Coil, A. C., 50 to 60 Cycle	150.00
1512	Cabinet for Model "E" Coil or Portable Coolidge Unit	30.00
1515	No. 12 Tube-stand	180.00
1516	Wood Floor Stand	15.00
1517	Wood, portable	6.00
1518	No. 12A	10.00
1519	No. 12B	10.00
	Fluoroscope	
1522	5 x 7, Folding	35.00
1523	Tube-shield, leaded rubber 6"	15.00
1524	Pump, compressed air and vacuum	150.00
1528	Auto Condensation Pad, with Cords	20.00
1529	Milliammeter with Bracket, for H. F. current	35.00
	Electrodes	
1530	Plain Electrodes (set)	10.00
1531	Surface Electrodes	1.50
1532	Vaginal Electrodes	1.50
1533	Rectal Electrodes	1.50
1534	Urethral Electrodes	1.50
1535	Nasal Electrodes	1.50
1536	Throat Electrodes	1.50
1537	Electrode Handle	2.00
	Insulated and Miscellaneous Electrodes	
1538	Insulated Vaginal	2.50
1539	Insulated Rectal	2.00
1540	Insulated Urethral	2.00
1541	Insulated Nasal	2.00
1542	Insulated Throat	2.00
1543	Insulated Ear	2.00
1544	Goitre Electrode	2.50
1545	Single Eye Electrode	1.50
1546	Double Eye Electrode	2.50
1547	Cataphoric Electrode	5.00

1548	Condenser (
1549	Block Tin
2107	Block Tin
1550	Treatment
1551	Treatment
1552	Fulguration
1553	Moist Elect
1554	Moist Elect
1555	Metal Hand
1556	Ozone Gene
1560	Rotary Con
1561	Rotary Con
1562	Rotary Con
1563	Rotary Con
1564	Morse Sine
1565	Morse Mois
	Cords
1567	Con
1568	Heav
1569	Ligh
1570	Caut
1571	Bifu
1572	Trea
1573	Cautery, H
1574	Cautery, Bl
1575	Diagnostic
1576	Diagnostic
	Miscellaneo
1577	Smal
1578	Rota
1579	Vacu
1580	Vacu
1581	Vacu
1582	Nebu
1583	Aton
1584	Pow
1585	Shut
1586	Eust
1587	Pilot
1591	Coolidge Be
1592	Coolidge Be Rheost
1593	Coolidge Be No. 15
1594	Coolidge Be
2007	Coolidge De
2010	Coolidge De
2011	Tube-shield
2012	Angle Indic
	Electrodes (
2015	Dent
2016	Dent
2017	Dent
2018	Dent
2019	Dent
2020	Dent
2021	Dent
2022	Instruments
2023	Mouth Lan
2024	Antrum La

Campbell

NUMERICAL LIST

1548	Condenser (Localizing Surface) Electrode	$ 5.00
1549	Block Tin Electrode, 5" x 7"	1.00
2107	Block Tin Electrode, 8" x 10"	1.50
1550	Treatment Chair, Vacuum Electrode, each	1.00
1551	Treatment Chair, Hand Electrode, each	1.50
1552	Fulguration Electrode Handle, with 2 Electrodes (Extra Electrode 25 cents)	4.50
1553	Moist Electrode, large	3.50
1554	Moist Electrode, small	3.00
1555	Metal Hand Electrode (pair)	.75
1556	Ozone Generator	20.00
1560	Rotary Converter, with step-up transformer, 6 ampere	150.00
1561	Rotary Converter, without step-up transformer, 6 ampere	100.00
1562	Rotary Converter, with step-up transformer, 12 ampere	200.00
1563	Rotary Converter, without step-up transformer, 12 ampere	150.00
1564	Morse Sine Wave Generator	300.00
1565	Morse Moist Pads (set)	10.00

Cords

1567	Connecting Cord, with Plugs	3.00
1568	Heavy Cable, with Hook	2.00
1569	Light Cable, with Hook	1.50
1570	Cautery Cords (pair)	1.50
1571	Bifurcated Cord	1.50
1572	Treatment Chair Cord	1.50
1573	Cautery, Handle and Blade	6.50
1574	Cautery, Blade only	2.00
1575	Diagnostic Lamp in holder	2.50
1576	Diagnostic Lamp Bulb	.50

Miscellaneous Parts

1577	Small Spark Gap Tips for Model E Coil (each)	2.00
1578	Rotating Spark Gap Plate	10.00
1579	Vacuum Cups, small	1.50
1580	Vacuum Cups, medium	1.50
1581	Vacuum Cups, large	1.50
1582	Nebulizer	3.00
1583	Atomizer	3.50
1584	Powder Blower	3.00
1585	Shut-off for bottles	2.50
1586	Eustachian Tube inflator	.50
1587	Pilot Lamp Bulb	.50
1591	Coolidge Bedside Stereoscopic, Counterweighted, Tube-Stand	100.00
1592	Coolidge Bedside Coil, Portable Type, 0 to 30 Milliamperes, 3" to 5" Spark Gap, Rheostat Control, (Single Unit.) A. C.	540.00
1593	Coolidge Bedside Portable, Separate Auto Transformer Control, for use with No. 1592 as Double Unit	100.00
1594	Coolidge Bedside Portable Tube Holder, Adjustable Bracket Type (Regular)	60.00
2007	Coolidge Dental Tube Holder, Adjustable Bracket Type (Regular)	60.00
2010	Coolidge Dental Tube-shield, Lead Glass	35.00
2011	Tube-shield leaded rubber 5"	15.00
2012	Angle Indicator	7.00

Electrodes (Glass vacuum).

2015	Dental Electrodes (set with handle)	12.00
2016	Dental Surface Electrode	1.75
2017	Dental Cavity or Pulp Tester	1.75
2018	Dental Gum	1.75
2019	Dental Pyorrhea	1.75
2020	Dental Cataphoric	1.75
2021	Dental Handle, with Cord	3.50
2022	Instruments, Switchboard (set) with Handle	35.00
2023	Mouth Lamp	4.50
2024	Antrum Lamp	4.50

NUMERICAL LIST

2025	Root Canal Drier	$ 4.50
2026	Gutta-Percha Excavator	4.50
2027	Cautery	4.50
2028	Canal Drier Needles, Fine	1.50
2029	Canal Drier Needles, Medium	1.50
2030	Canal Drier Needles, Coarse	1.50
2031	Wax Spatula	3.25
2043	Film Chest, Dental Lead	12.00
2044	Film Illuminator, Dental	7.50
2045	Ammeter. For Coolidge Filament Transformer	30.00
2046	Developing Cabinet (Portable Dark Room)	45.00
2047	Developing Cabinet, with Trays, Films and Chemicals	50.00
	Plate Containers (Negative Preservers) (for filing).	
2049	5 x 7, per 100	.35
2050	6½ x 8½, per 100	.60
2051	8 x 10, per 100	.65
2052	10 x 12, per 100	1.35
2053	11 x 14, per 100	1.80
2054	14 x 17, per 100	2.25
2060	Foil, Lead, for X-ray Protection in Treatment, per lb.	.50
2061	Lead Glass Protective, Regular Plate Sizes, per sq. inch	.05
2062	Interval Timer	8.00
2063	Benoist Penetrometer	4.00
2064	Films, Eastman Dupli-Tized, Size 5" x 7" with envelopes, per dozen	1.25
2065	Films, Eastman Dupli-Tized, Size 6½" x 8½" with envelopes, per dozen	2.00
2066	Films, Eastman Dupli-Tized, Size 8" x 10" with envelopes, per dozen	2.85
2067	Films, Eastman Dupli-Tized, Size 10" x 12" with envelopes, per dozen	4.50
2068	Films, Eastman Dupli-Tized, Size 11" x 14" with envelopes, per dozen	5.55
2069	Films, Eastman Dupli-Tized, Size 14" x 17" with envelopes, per dozen	8.75
2071	Coolidge Dental Tube Holder, Bracket Type, (Stereoscopic)	95.00
2072	Coolidge Bedside Tube Holder, Bracket Type, (Stereoscopic)	95.00
2081	Automatic Time Controller for Coolidge Bedside Unit (Cabinet Type)	60.00
2082	Automatic Time Controller for Coolidge Bedside (Portable Type)	60.00
2083	Automatic Time Controller for Coolidge Dental Unit	60.00
2084	Campbell Coolidge Clinical Unit Coil, Metal Cabinet, 3, 4 and 5" gap, 0 to 30 m/a, A. C.	680.00
2085	Developing frame for Eastman Dupli-Tized Films	1.50
2086	Clinix—Self-Excited—Tube-Tilt Table, Motor Driven, with Screen, no Stand	2200.00
2087	Clinix—Self-Excited—Tube-Tilt Table, Motor Driven, with Screen and No. 6 Stand	2500.00
2088	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 5 x 7	15.00
2089	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 8 x 10	32.50
2090	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 10 x 12	50.00
2091	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 11 x 14	65.00
2092	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 14 x 17	100.00
	(For Cassette prices, see Catalog Numbers 1053 to 1057, inclusive.)	
2093	Extra High Tension Transformer, for No. 6 Stand, Sold only for Clinix	450.00
2094	Clinix Table without Stand, Transformer or Control, with Screen and Motor	1650.00
2095	Clinix Table without Stand, Motor, Transformer or Control, with Screen	1550.00
2096	Blackman Hand Electrode	5.00
2097	Centering Rod for No. 6 Tube Stand	7.50
2098	Grover's X-ray Dose Indicator	3.00
2099	Dental Coil, A. C., 50 to 60 Cy., Metal Cabinet, Mahogany Finish	600.00
2100	Exposure Holders for Dupli-Tized Film 5 x 7, ea.	.15
2101	Exposure Holders for Dupli-Tized Film 6½ x 8½	.15
2102	Exposure Holders for Dupli-Tized Film 8 x 10	.20
2103	Exposure Holders for Dupli-Tized Film 10 x 12	.25
2104	Exposure Holders for Dupli-Tized Film 11 x 14	.25
2105	Exposure Holders for Dupli-Tized Film 14 x 17	.35
2106	Dental Tube Holder, Engine Type, Long range, Automatic	110.00
2107	Block Tin Electrode, 8" x 10"	1.50
2108		
2109		
2110		

2111
2112
2113
2114
2115
2116
2117
2118
2119
2120

........$ 4.50
.... 4.50
.... 4.50
.... 1.50
.... 1.50
.... 1.50
.... 3.25

.... 12.00
.... 7.50
.... 30.00
.... 45.00
.... 50.00

.... .35
.... .60
.... .65
.... 1.35
.... 1.80
.... 2.25

.... .50
.... .05
.... 8.00
.... 4.00
.... 1.25
.... 2.00
.... 2.85
.... 4.50
.... 5.55
.... 8.75
.... 95.00
.... 95.00
.... 60.00
.... 60.00
.... 60.00
a/a, A.C. 680.00
.... 1.50
tand....2200.00
.6 Stand 2500.00
a, 5 x 7 15.00
s, 8 x 10 32.50
s, 10 x 12 50.00
s, 11 x 14 65.00
a, 14 x 17 100.00
e.)

.... 450.00
Iotor ... 1650.00
1 .... 1550.00
.... 5.00
.... 7.50
.... 3.00
.... 600.00
.... .15
.... .15
.... .20
.... .25
.... .25
.... .35
.... 110.00
.... 1.50

....
....
....

Campbell

NUMERICAL LIST

2111 ....
2112 ....
2113 ....
2114 ....
2115 ....
2116 ....
2117 ....
2118 ....
2119 ....
2120 ....

Campbell
Electric Co.
Lynn, Mass

PRICES IN EFFECT APRIL 1, 1920

Which supersede prices listed in all catalogues
issued to date and made necessary to
PRESERVE QUALITY

CAMPBELL ELECTRIC COMPANY
CAMPBELL ELEC. CO.
CAMPBELL ELECTRIC COMPANY

"The Plant That Serves You"

CAMPBELL ELECTRIC COMPANY

LYNN, MASSACHUSETTS

ALPHABETICAL LIST

1025	Coolidge Tube Filament Transformer with Control, A. C. (Specify Voltage)	$ 85.00
2045	Coolidge Tube Ammeter for above Transformer	25.00
	Coolidge Units—Outfits.	
2084	Clinical Coil, Metal Cabinet Type, A. C., 50 to 60 Cycle	680.00
	(Will operate either 10 Milliampere or 30 Milliampere Tube with 3, 4 and 5″ gap.)	
1591	Tube-stand, Counterweighted, Stereoscopic	100.00
1037	Foot Switch, with Cable and Plug	30.00
1260	Tube-shield, Lead Glass	25.00
1270	Coolidge Radiator Bedside Tube	125.00
	Outfit Complete	**1050.00**
2081	Extra for Automatic Time Controller	50.00
	Extra for use on 110 V. D. C., 10 Milliamperes	150.00
1592	Bedside Coil, Portable Type, 1 to 20 Milliamperes, 3″ to 5″ Spark Gap, Rheostat Control (Single Unit), A. C.	540.00
1593	Separate Auto Transformer Control for Portable Coil (Double Unit)	100.00
1594	Tube Holder, Adjustable Bracket Type	60.00
1260	Tube-shield, Lead Glass	25.00
1270	Coolidge Radiator Bedside Tube	125.00
	Outfit Complete (Single Unit)	**750.00**
	(Double Unit)	**850.00**
	Extra for Stereoscopic Tube Holder (Catalog No. 2072)	25.00
2082	Extra for Automatic Time Controller	50.00
	Extra for use on 110 V. D. C., 10 Milliamperes	150.00
1200	Dental-Coil, A. C., 50 to 60 Cycle, Mahogany Finish	600.00
2007	Tube Holder (Adjustable Bracket Type)	60.00
1037	Foot Switch, with Cable and Plug	30.00
2010	Tube-shield, Lead Glass	35.00
1029	Coolidge Radiator Dental Tube	125.00
	Outfit Complete	**850.00**
	Extra for Stereoscopic Tube Holder (Catalog No. 2071)	25.00
2083	Extra for Automatic Time Controller	50.00
	Extra for use on 110 V. D. C.	100.00
1078	Coolidge Tube Reel	7.00
1073	Coolidge Tube Reel, with Trolley Wheels	9.00
1004	Control Table for No. 12 SureX, instead of switchboard attached, difference extra	150.00
	Cords	
1567	Connecting Cord, with Plugs	3.00
1568	Heavy Cable, with Hook	2.00
1569	Light Cable, with Hook	1.50
1570	Cautery Cords (pair)	1.50
1571	Bifurcated Cord	1.50
1572	Treatment Chair Cord	1.50
	Cord Reels. (See Reels.)	
	Dark Room Supplies	
1110	Developing Tank, stone	55.00
1111	Developing Tank, plate racks, each, 5 x 7	1.40
1112	Developing Tank, plate racks, each, 6½ x 8½	1.40
1113	Developing Tank, plate racks, each, 8 x 10	1.40
1114	Developing Tank, plate racks, each, 10 x 12	1.40
1115	Developing Tank, plate racks, each, 11 x 14	1.75
1116	Developing Tank, plate racks, each, 14 x 17	1.75
1117	Developer, Eastman X-ray, ½ dozen packages (each makes 12 oz.)	.90
1118	Fixing Powder (makes 64 oz.)	.25
1119	Hard Rubber Fixing Box	18.50
1120	Graduate, 8 ounces	.55
1121	Graduate, 16 ounces	.75
1122	Drying Rack	2.50
1123	Mortar and Pestle	.60
1124	Ruby Lamp and Illuminator, 7″ x 9″ Ruby—5″ x 8″ White	12.00
1126	Balance Scales	5.00
1127	Thermometer Stirring Rod	1.00
2062	Interval Timer (For Timing Development)	8.00
1128	Trays, 8 x 10	1.50

	Dark Room Supplies
1129	Trays, 10 x 1
1130	Trays, 11 x 1
1131	Trays, 14 x 1
1132	Wash Box to
	(See Films
2046	Developing Cabinet
2047	Developing Cabinet,
2085	Developing Frame f
	Developing Tanks, I
1575	Diagnostic Lamp in
1576	Diagnostic Lamp B
1122	Drying Rack
	Electrodes. (Glass
1530	Plain Electrodes (
1531	Surface Elect
1532	Vaginal Elect
1533	Rectal Electr
1534	Urethral Elec
1535	Nasal Electro
1536	Throat Electr
1537	Electrode Ha
2015	Dental Electr
2016	Dental Surfac
2017	Dental Cavit
2018	Dental Gum
2019	Dental Pyorr
2020	Dental Catap
2021	Dental Handl
	Insulated and Mi
1538	Insulated Va
1539	Insulated Re
1540	Insulated Ur
1541	Insulated Na
1542	Insulated Th
1543	Insulated Ea
1544	Goitre Electr
1545	Single Eye El
1546	Double Eye
1547	Cataphoric E
1548	Condenser
1549	Block Tin El
1550	Treatment Cl
1551	Treatment Cl
1552	Fulguration E
1553	Moist Electro
1554	Moist Electro
1555	Metal Hand
1565	Morse Moist
	Non-Vacuum
1586	Eustachian Tube In
	Films, Dental.
1105	1¼″ x 1¾″, per
1106	1¾″ x 2¼″, per
1107	2¼″ x 3″, per
	Films, Eastman Du
2064	Size 5″ x
2065	Size 6½″ x
2066	Size 8″ x
2067	Size 10″ x
2068	Size 11″ x
2069	Size 14″ x

e) ....$ 85.00
.... 25.00

.... 680.00
s 3, 4

.... 190.00
.... 30.00
.... 25.00
.... 125.00
.... **1050.00**
.... 50.00
.... 150.00
k Gap,
.... 540.00
t) 100.00
.... 60.00
.... 25.00
.... 125.00
.... **750.00**
.... **850.00**
.... 25.00
.... 50.00
.... 150.00

.... 600.00
.... 60.00
.... 30.00
.... 35.00
.... 125.00
.... **850.00**
.... 25.00
.... 50.00
.... 100.00

.... 7.00
.... 9.00
ce extra 150.00

.... 3.00
.... 2.00
.... 1.50
.... 1.50
.... 1.50
.... 1.50

.... 55.00
.... 1.40
.... 1.40
.... 1.40
.... 1.40
.... 1.75
.... 1.75
.... .90
.... .25
.... 18.50
.... .55
.... .75
.... 2.50
.... .60
.... 12.00
.... 5.00
.... 1.00
.... 8.00
.... 1.50

ALPHABETICAL LIST

	Dark Room Supplies	
1129	Trays, 10 x 12	$ 3.00
1130	Trays, 11 x 14	4.00
1131	Trays, 14 x 17	6.00
1132	Wash Box to hold 14 x 17 Plates	12.00
	(See Films and Plates.)	
2046	Developing Cabinet (Portable Dark Room)	40.00
2047	Developing Cabinet, with Trays, Films and Chemicals	45.00
2085	Developing Frame for Eastman Dupli-Tized Films, each	1.50
	Developing Tanks, Developer, etc. (See Dark Room Supplies.)	
1575	Diagnostic Lamp in holder	1.50
1576	Diagnostic Lamp Bulb	.50
1122	Drying Rack	2.50
	Electrodes. (Glass Vacuum.)	
1530	Plain Electrodes (set with handle)	8.00
1531	Surface Electrode	1.00
1532	Vaginal Electrode	1.00
1533	Rectal Electrode	1.00
1534	Urethral Electrode	1.00
1535	Nasal Electrode	1.00
1536	Throat Electrode	1.00
1537	Electrode Handle	2.00
2015	Dental Electrodes (set with handle)	10.00
2016	Dental Surface Electrode	1.00
2017	Dental Cavity or Pulp Tester	1.75
2018	Dental Gum	1.75
2019	Dental Pyorrhea	1.75
2020	Dental Cataphoric	1.75
2021	Dental Handle, with Cord	3.50
	Insulated and Miscellaneous Electrodes	
1538	Insulated Vaginal	2.00
1539	Insulated Rectal	1.75
1540	Insulated Urethral	1.75
1541	Insulated Nasal	1.75
1542	Insulated Throat	1.75
1543	Insulated Ear	1.75
1544	Goitre Electrode	2.00
1545	Single Eye Electrode	1.00
1546	Double Eye Electrode	2.00
1547	Cataphoric Electrode	4.00
1548	Condenser	4.00
1549	Block Tin Electrode	.75
1550	Treatment Chair, Vacuum Electrode, each	.75
1551	Treatment Chair, Hand Electrode, each	1.00
1552	Fulguration Electrode Handle, with 2 Electrodes (Extra Electrode 25 cents)	3.50
1553	Moist Electrode, large	3.00
1554	Moist Electrode, small	2.50
1555	Metal Hand Electrode (pair)	.75
1565	Morse Moist Pads (set)	10.00
	Non-Vacuum Electrodes, any kind, each	7.50
1586	Eustachian Tube Inflator	.50
	Films, Dental.	
1105	1¼" x 1¾", per dozen	.50
1106	1¼" x 2¼", per dozen	.85
1107	2¼" x 3", per dozen	1.75
	Films, Eastman Dupli-Tized.	
2064	Size 5" x 7" with envelopes, per doz.	1.25
2065	Size 6½" x 8½" with envelopes, per doz.	2.00
2066	Size 8" x 10" with envelopes, per doz.	2.85
2067	Size 10" x 12" with envelopes, per doz.	4.50
2068	Size 11" x 14" with envelopes, per doz.	5.55
2069	Size 14" x 17" with envelopes, per doz.	8.75

ALPHABETICAL LIST

2043	Film Chest, Dental Lead	$10.00
1140	Film Clamps, for developing, per dozen	2.50
1141	Film Holders, for Dental Radiography, each	.75
2044	Film Illuminator, Dental	6.00
1108	Film Mounts, cardboard, per hundred	4.50
1109	Film Mounts, transparent, per hundred	5.50
	Filters, aluminum	
1079	1 mm.	.75
1080	2 mm.	1.00
1081	3 mm.	1.25
1118	Fixing Powder (make 64 oz.)	.25
	Fluoroscope	
1522	5 x 7, Folding	27.00
1039	8 x 10, not Folding	42.00
	Fluoroscope Screens	
1040	8 x 10	32.50
1041	10 x 12	48.00
1042	11 x 14	65.00
1043	14 x 17	95.00
	Fluoroscope Screen mounted in Oak Frame, with lead glass.	
1044	8 x 10	47.00
1045	10 x 12	68.00
1046	11 x 14	85.00
1047	14 x 17	125.00
	Fluoroscopy—Vertical, Horizontal, Angular. (See Tables.)	
2060	Foil. Lead, for X-ray Protection in Treatment, per lb.	.50
1036	Foot Switch, heavy capacity, double contact, to control lamp	35.00
1037	Foot Switch, heavy capacity, single contact	30.00
1091	Gloves, opaque protective (plain)	12.00
1092	Gloves, opaque protective (gauntlet)	15.00
1120	Graduate, 8 ounces	.55
1121	Graduate, 16 ounces	.75
1119	Hard Rubber Fixing Box	18.50
1035	Illuminator, Negative (with Nitrogen Lamps and Dimmers)	50.00
1124	Illuminator and Ruby Lamp combined, for up to 8 x 10 Plates	12.00
2022	Instruments, Switchboard (set) with handle	25.00
2023	Mouth Lamp	3.50
2024	Antrum Lamp	3.50
2025	Root Canal Drier	3.50
2026	Gutta-Percha Excavator	3.50
2027	Cautery	3.50
2028	Canal Drier Needles, Fine	.75
2029	Canal Drier Needles, Medium	.75
2030	Canal Drier Needles, Coarse	.75
2031	Wax Spatula	2.25
1069	Insulators, wall (Strain, for Trolley System), with Turnbuckle	3.50
1074	Insulator 2 foot H. T. for Connecting Rooms	6.00
	Intensifying Screens (Single).	
1048	5 x 7	10.00
1049	8 x 10	20.00
1050	10 x 12	30.00
1051	11 x 14	40.00
1052	14 x 17	60.00

	Intensify
2088	
2089	
2090	1
2091	1
2092	1
	Intensify
1058	
1059	
1060	1
1061	1
1062	1
2062	Interval
2060	Lead Fo
2061	Lead Gl
1090	Lead Pr
1091	Lead Pr
1092	Lead Pr
1012	Lead Pr
1011	Lead Pr
1008	Milamm
1529	Milamm
1564	Morse S
1565	Morse M
1123	Mortar
1107	Mounts
1108	Mounts
1582	Nebuliz
	Overhea
1556	Ozone G
1134	Pastilles
2063	Penetro
	Photogr
1587	Pilot La
	Plates,
1093	
1094	6
1095	
1096	1
1097	1
1098	1
1099	
1100	6
1101	
1102	1
1103	1
1104	1
	Plate C
2049	5
2050	6
2051	8
2052	1
2053	1
2054	1
1083	Plate B
1063	Plate C
1064	Plate C
1065	Plate C
1066	Plate C

Campbell

ALPHABETICAL LIST

	Intensifying Screens (Double), Combination for use with Dupli-Tized Films.	
2088	5 x 7 (The pair)	$ 15.00
2089	8 x 10 " "	32.50
2090	10 x 12 " "	50.00
2091	11 x 14 " "	65.00
2092	14 x 17 " "	100.00
	(For Cassette prices, see Catalog Numbers 1053 to 1057, inclusive.)	
	Intensifying Screens (Single), with Cassettes	
1058	5 x 7	19.00
1059	8 x 10	31.00
1060	10 x 12	43.50
1061	11 x 14	50.00
1062	14 x 17	82.50
2062	Interval Timer	8.00
2060	Lead Foil. For Protection in X-ray Treatment, per lb.	.50
2061	Lead Glass. Protective, Regular Plate Sizes, per square inch	.05
1090	Lead Protective Rubber Apron	15.00
1091	Lead Protective Gloves (plain)	12.00
1092	Lead Protective Gloves (gauntlet)	15.00
1012	Lead Protective Screen, Hinged to Cabinet of SureX Transformer	80.00
1011	Lead Protective Screen, separate	80.00
1008	Milammeter for SureX, 8-inch diameter, 0–15—0–150M/A	55.00
1529	Milammeter with Bracket, for H. F. current	35.00
1564	Morse Sine Wave Generator	300.00
1565	Morse Moist Electrodes (set)	10.00
1123	Mortar and Pestle	.60
1107	Mounts for Dental Films, Cardboard, double film per 100	5.50
1108	Mounts for Dental Films, Cardboard, single film per 100	4.50
1582	Nebulizer	2.00
	Overhead Trolley System. (See Aerial System.)	
1556	Ozone Generator	12.00
1134	Pastilles, Sabouraud, 25 cents each	.25
2063	Penetrometer (Benoist)	3.00
	Photographic Supplies. (See Dark Room Supplies.)	
1587	Pilot Lamp Bulb	.50
	Plates, X-ray	
1093	5 x 7 Seed X-ray Plates with envelopes, per dozen	1.70
1094	6½ x 8½ Seed X-ray Plates with envelopes, per dozen	2.55
1095	8 x 10 Seed X-ray Plates with envelopes, per dozen	3.00
1096	10 x 12 Seed X-ray Plates with envelopes, per dozen	6.10
1097	11 x 14 Seed X-ray Plates with envelopes, per dozen	8.50
1098	14 x 17 Seed X-ray Plates with envelopes, per dozen	13.50
1099	5 x 7 Seed X-ray Plates without envelopes, per dozen	1.40
1100	6½ x 8½ Seed X-ray Plates without envelopes, per dozen	2.10
1101	8 x 10 Seed X-ray Plates without envelopes, per dozen	3.00
1102	10 x 12 Seed X-ray Plates without envelopes, per dozen	5.15
1103	11 x 14 Seed X-ray Plates without envelopes, per dozen	7.25
1104	14 x 17 Seed X-ray Plates without envelopes, per dozen	11.25
	Plate Containers. (Negative Preservers) for Filing.	
2049	5 x 7 per 100	.35
2050	6½ x 8½ per 100	.60
2051	8 x 10 per 100	.65
2052	10 x 12 per 100	1.35
2053	11 x 14 per 100	1.80
2054	14 x 17 per 100	2.25
1083	Plate Box, lead lined	40.00
1063	Plate Changing Tunnel, 10 x 10	12.00
1064	Plate Changing Tunnel, 12 x 12	16.00
1065	Plate Changing Tunnel, 14 x 14	20.00
1066	Plate Changing Tunnel, 17 x 17	25.00

Campbell

ALPHABETICAL LIST

1088	Plate Marker	$ 5.00
1584	Powder Blower	2.00
1012	Protective Screen, hinged to cabinet of SureX Transformer	80.00
1011	Protective Screen, separate	80.00
1524	Pump, compressed air and vacuum	125.00
1089	Radiometer, Hampson	18.00
	Reels	
1566	6 feet Cord Reel	2.50
1077	9 feet Cord Reel	3.00
1071	9 feet Cord Reel, with Wheels	5.00
1078	Coolidge Tube Reel	7.00
1073	Coolidge Tube Reel, with Wheels	9.00
	Rebuild X-ray Tube, 5", 6" or 7"	30.00
	Re-exhaust X-ray Tubes, 5", 6" or 7"	8.00
1560	Rotary Converter with step-up transformer, 6 ampere	125.00
1561	Rotary Converter without step-up transformer, 6 ampere	100.00
1562	Rotary Converter with step-up transformer, 12 ampere	185.00
1563	Rotary Converter without step-up transformer, 12 ampere	150.00
1578	Rotating Spark Gap Plate	7.50
1006	Rubber, X-ray Protective, per sq. ft.	3.00
1090	Rubber Apron, Lead Protective	15.00
1124	Ruby Lamp and Illuminator, CAMPBELL combination, for up to 8 x 10 plates	12.00
1134	Sabouraud Pastilles, each	.25
	Scales (see Dark Room Supplies).	
	Screens, Fluoroscopic (see fluoroscopic screens).	
	Screens, Intensifying (see Intensifying screens).	
1577	Spark Gap Tips, for E Coil (each)	1.50
1585	Shut-off for bottles	2.00
1082	Sinus Head Block	5.00
	Stands. (See Tube-stands.)	
1034	Stereoscope, with Nitrogen Lamps and Dimmers	150.00
	"SureX" Interrupterless Transformer	
1000	No. 12 A. C., 220V., 60 Cycle (or 110 Volt, if ordered) Switchboard attached	1450.00
1001	No. 12 D. C., 220V., (or 110 Volt, if ordered) Switchboard attached	1650.00
1002	No. 2 A. C., 220 V., 60 Cycle, Switchboard attached, (Army Type)	1350.00
1003	No. 2 D. C., 220 V., Switchboard attached, (Army Type)	1550.00
1004	Separate Control Table instead Switchboard attached, difference extra	150.00
1075	Switch, High Tension Aerial	40.00
	Switchboard Instruments. (See Instruments.)	
	Tables—"Clinix"—Self-Excited—Tube Tilt—Motor Driven—Auto Control.	
2086	Clinix Tube-tilt Table without Stand, with 11 x 14 screen and Automatic Screen Attachment	2200.00
2087	Clinix Tube-tilt Table, No. 6 Tube-stand, 11 x 14 Fluoroscope Screen, Automatic Screen attachment, Motor Drive, Auto Control, complete	2500.00
1127	Thermometer Stirring Rod	1.00
1009	Time Controller	60.00
1010	Time Controller, with switch mounted on separate panel	70.00
2081	Time Controller for Coolidge Bedside Unit Cabinet Type	50.00
2082	Time Controller for Coolidge Bedside Unit Portable Type	50.00
2083	Time Controller for Coolidge Dental Unit	50.00
	Transformer—Coolidge, see Coolidge Transformers and Units.	
	Transformers—Interrupterless, see SureX Transformers.	
1128	Trays, 8 x 10	1.50
1129	Trays, 10 x 12	3.00
1130	Trays, 11 x 14	4.00
1131	Trays, 14 x 17	6.00

1007	Treatment
	Trolley Sys
1076	Trolley Wh
1071	Trolley Ree
1070	Trolley Wir
	Tubes
1022	Tube
1023	Tube
1024	Tube
1029	Tube
1270	Tube
1027	Tube
1028	Tube
	Tube
	Tube
	Tube-rack
1084	1 Ur
1085	2 Ur
1086	4 Ur
1087	6 Ur
2011	Tube-shield
1523	Tube-shield
2010	Tube-shield
1260	Tube-shield
	Tube-stand
1517	Woo
1516	Woo
2006	No.
2007	Cool
2071	Cool
1594	Cool
2072	Cool
1591	Cool
1515	No.
1013	No.
	Units. (Se
1579	Vacuum C
1580	Vacuum C
1581	Vacuum C
1035	View Box (
1068	Wall Boar
1067	Wall Insula
1132	Wash Box
1070	Wire for T

ALPHABETICAL LIST

1007	Treatment Chair (Auto-Condensation), with Head and Leg Sections	$ 75.00
	Trolley System, see Aerial System.	
1076	Trolley Wheels	2.00
1071	Trolley Reels, with Wheels, 9 feet	5.00
1070	Trolley Wire, per foot	.05
	Tubes	
1022	Tube, Coolidge, fine focus, 7"	125.00
1023	Tube, Coolidge, medium focus, 7"	125.00
1024	Tube, Coolidge, broad focus, 7"	125.00
1029	Tube, Coolidge Dental, Radiator Type	125.00
1270	Tube, Coolidge Bedside, Radiator Type	125.00
1027	Tube, 6" Tungsten Target (High-Frequency)	40.50
1028	Tube, 7" Heavy Tungsten Target (Transformer)	43.50
	Tube Rebuild, using old Tungsten Target 5", 6" or 7"	30.00
	Tube, Re-exhaust 5", 6" or 7"	8.00
	Tube-rack	
1084	1 Unit	2.50
1085	2 Unit	4.00
1086	4 Unit	6.00
1087	6 Unit	9.00
2011	Tube-shield, leaded rubber 5"	12.00
1523	Tube-shield, leaded rubber 6"	12.00
2010	Tube-shield, for Coolidge Dental Tube, Lead Glass	35.00
1260	Tube-shield, for Coolidge Bedside Tube, Lead Glass	25.00
	Tube-stands	
1517	Wood, portable	4.50
1516	Wood Floor Stand	12.00
2006	No. 8 Bracket Tube Holder (for Gas Tube)	60.00
2007	Coolidge Dental Tube Holder (Bracket Type) (Regular)	60.00
2071	Coolidge Dental Tube Holder, Bracket Type (Stereoscopic)	85.00
1594	Coolidge Bedside Portable Tube Holder (Bracket Type) (Regular)	60.00
2072	Coolidge Bedside Portable Tube Holder (Bracket Type) (Stereoscopic)	85.00
1591	Coolidge Bedside, Counterweighted, Stereoscopic	190.00
1515	No. 12 Tube Stand	150.00
1013	No. 6 Stereoscopic, with Cone, Diaphragm and Centering Device	300.00
	Units. (See Coolidge Units.)	
1579	Vacuum Cups, small	.75
1580	Vacuum Cups, medium	.75
1581	Vacuum Cups, large	.75
1035	View Box (Plate Illuminator) Size 17" x 17" with Nitrogen Lamps and Dimmer	50.00
1068	Wall Board	2.00
1067	Wall Insulator (Strain) without Turnbuckle)	3.00
1132	Wash Box to hold 14 x 17 Plates	12.00
1070	Wire for Trolley System, per ft.	.05

$ 5.00
2.00
80.00
80.00
125.00
18.00

2.50
3.00
5.00
7.00
9.00

30.00
8.00

125.00
100.00
185.00
150.00

7.50
3.00

15.00
10 plates 12.00
.25

1.50
2.00
5.00

150.00

d attached 1450.00
ched 1650.00
pe) 1350.00
1550.00
e extra 150.00
40.00

o Control.
atic Screen
2200.00
en, Auto-
2500.00

1.00
60.00
70.00
50.00
50.00
50.00

1.50
3.00
4.00
6.00

Campbell

NUMERICAL LIST

	Dark Room Supplies	
1110	Developing Tank, stone	$ 55.00
1111	Developing Tank, plate racks, each, 5 x 7	1.40
1112	Developing Tank, plate racks, each, 6½ x 8½	1.40
1113	Developing Tank, plate racks, each, 8 x 10	1.40
1114	Developing Tank, plate racks, each, 10 x 12	1.40
1115	Developing Tank, plate racks, each, 11 x 14	1.75
1116	Developing Tank, plate racks, each, 14 x 17	1.75
1117	Developer, Eastman X-ray, ½ dozen packages (each package makes 12 oz.)	.90
1118	Fixing Powder (makes 64 oz.)	.25
1119	Hard Rubber Fixing Box	18.50
1120	Graduate, 8 ounces	.55
1121	Graduate, 16 ounces	.75
1122	Drying Rack	2.50
1123	Mortar and Pestle	2.50
1124	Ruby Lamp and Illuminator, CAMPBELL combination. For up to 8 x 10 Plates	12.00
1126	Balance Scales	5.00
1127	Thermometer Stirring Rod	1.00
1128	Trays, 8 x 10	1.50
1129	Trays, 10 x 12	3.00
1130	Trays, 11 x 14	4.00
1131	Trays, 14 x 17	6.00
1132	Wash Box to hold 14 x 17 Plates	12.00
1134	Sabouraud Pastilles, High Frequency Coil, each	.25
1140	Film Clamps. For developing, per dozen	2.50
1141	Film Holders. For dental radiography, each	.75
1150	Army (U. S.) Manual	4.00
1200	Dental Coil (Coolidge Dental Unit), A. C., 50 to 60 Cycle, Mahogany finish	600.00
1260	Bedside Tube-shield, Lead Glass	25.00
1270	Coolidge Radiator Bedside Tube	125.00
1504	Model "I", High Frequency Coil, A. C., 50 to 60 Cycle	450.00
1505	Model "I", High Frequency Coil, with Pump, A. C., 50 to 60 Cycle	575.00
1509	Model "E", High Frequency Coil, A. C., 50 to 60 Cycle	250.00
1511	Model "H", High Frequency Coil, A. C., 50 to 60 Cycle	125.00
1512	Cabinet for Model "E" Coil or Portable Coolidge Unit	30.00
1515	No. 12 Tube-stand	150.00
1516	Wood Floor Stand	12.00
1517	Wood, portable	4.50
1518	No. 12A	8.00
1519	No. 12B	8.00
	Fluoroscope	
1522	5 x 7, Folding	27.00
1523	Tube-shield, leaded rubber 6"	12.00
1524	Pump, compressed air and vacuum	125.00
1528	Auto Condensation Pad, with Cords	18.00
1529	Milliammeter with Bracket, for H. F. current	35.00
	Electrodes	
1530	Plain Electrodes (set)	8.00
1531	Surface Electrodes	1.00
1532	Vaginal Electrodes	1.00
1533	Rectal Electrodes	1.00
1534	Urethral Electrodes	1.00
1535	Nasal Electrodes	1.00
1536	Throat Electrodes	1.00
1537	Electrode Handle	2.00
	Insulated and Miscellaneous Electrodes	
1538	Insulated Vaginal	2.00
1539	Insulated Rectal	1.75
1540	Insulated Urethral	1.75
1541	Insulated Nasal	1.75
1542	Insulated Throat	1.75
1543	Insulated Ear	1.75
1544	Goitre Electrode	2.00
1545	Single Eye Electrode	1.00
1546	Double Eye Electrode	2.00
1547	Cataphoric Electrode	4.00

NUMERICAL LIST

1548	Condenser	$ 4.00
1549	Block Tin Electrode	.75
1550	Treatment Chair, Vacuum Electrode, each	.75
1551	Treatment Chair, Hand Electrode, each	1.00
1552	Fulguration Electrode Handle, with 2 Electrodes (Extra Electrode 25 cents)	3.50
1553	Moist Electrode, large	3.00
1554	Moist Electrode, small	2.50
1555	Metal Hand Electrode (pair)	.75
1556	Ozone Generator	12.00
1560	Rotary Converter, with step-up transformer, 6 ampere	125.00
1561	Rotary Converter, without step-up transformer, 6 ampere	100.00
1562	Rotary Converter, with step-up transformer, 12 ampere	185.00
1563	Rotary Converter, without step-up transformer, 12 ampere	150.00
1564	Morse Sine Wave Generator	300.00
1565	Morse Moist Pads (set)	10.00
	Cords	
1567	Connecting Cord, with Plugs	3.00
1568	Heavy Cable, with Hook	2.00
1569	Light Cable, with Hook	1.50
1570	Cautery Cords (pair)	1.50
1571	Bifurcated Cord	1.50
1572	Treatment Chair Cord	1.50
1573	Cautery, Handle and Blade	6.00
1574	Cautery, Blade only	1.50
1575	Diagnostic Lamp in holder	1.50
1576	Diagnostic Lamp Bulb	.50
	Miscellaneous Parts	
1577	Small Spark Gap Tips for Model E Coil (each)	1.50
1578	Rotating Spark Gap Plate	7.50
1579	Vacuum Cups, small	.75
1580	Vacuum Cups, medium	.75
1581	Vacuum Cups, large	.75
1582	Nebulizer	2.00
1583	Atomizer	2.50
1584	Powder Blower	2.00
1585	Shut-off for bottles	2.00
1586	Eustachian Tube inflator	.50
1587	Pilot Lamp Bulb	.50
1591	Coolidge Bedside Stereoscopic, Counterweighted, Tube-Stand	190.00
1592	Coolidge Bedside Coil, Portable Type, 1 to 20 Milliamperes, 3" to 5" Spark Gap, Rheostat Control, (Single Unit.) A. C.	540.00
1593	Coolidge Bedside Portable, Separate Auto Transformer Control, for use with No. 1502 as Double Unit	100.00
1594	Coolidge Bedside Portable Tube Holder, Adjustable Bracket Type (Regular)	60.00
2002	Dental Induction Coil, for D. C. only	450.00
2006	No. 8 Bracket Tube Holder (for use with gas tube)	60.00
2007	Coolidge Dental Tube Holder, Adjustable Bracket Type (Regular)	60.00
2010	Coolidge Dental Tube-shield, Lead Glass	35.00
2011	Tube-shield leaded rubber 5"	12.00
2012	Angle Indicator	6.00
	Electrodes (Glass vacuum).	
2015	Dental Electrodes (set with handle)	10.00
2016	Dental Surface Electrode	1.00
2017	Dental Cavity or Pulp Tester	1.75
2018	Dental Gum	1.75
2019	Dental Pyorrhea	1.75
2020	Dental Cataphoric	1.75
2021	Dental Handle, with Cord	3.50
2022	Instruments, Switchboard (set) with Handle	25.00
2023	Mouth Lamp	3.50
2024	Antrum Lamp	3.50

..... $ 55.00
..... 1.40
..... 1.40
..... 1.40
..... 1.40
..... 1.75
..... 1.75
..... .90
..... .25
..... 18.50
..... .55
..... .75
..... 2.50
..... 2.50

..... 12.00
..... 5.00
..... 1.00
..... 1.50
..... 3.00
..... 4.00
..... 6.00
..... 12.00
..... .25
..... 2.50
..... .75
..... 4.00
..... 600.00
..... 25.00
..... 125.00
..... 450.00
..... 575.00
..... 250.00
..... 125.00
..... 30.00
..... 150.00
..... 12.00
..... 4.50
..... 8.00
..... 8.00

..... 27.00
..... 12.00
..... 125.00
..... 18.00
..... 35.00

..... 8.00
..... 1.00
..... 1.00
..... 1.00
..... 1.00
..... 1.00
..... 1.00
..... 2.00

..... 2.00
..... 1.75
..... 1.75
..... 1.75
..... 1.75
..... 1.75
..... 2.00
..... 1.00
..... 2.00
..... 4.00

Campbell

NUMERICAL LIST

2025	Root Canal Drier	$ 3.50
2026	Gutta-Percha Excavator	3.50
2027	Cautery	3.50
2028	Canal Drier Needles, Fine	.75
2029	Canal Drier Needles, Medium	.75
2030	Canal Drier Needles, Coarse	.75
2031	Wax Spatula	2.25
2043	Film Chest, Dental Lead	10.00
2044	Film Illuminator, Dental	6.00
2045	Ammeter. For Coolidge Filament Transformer	25.00
2046	Developing Cabinet (Portable Dark Room)	40.00
2047	Developing Cabinet, with Trays, Films and Chemicals	45.00
	Plate Containers (Negative Preservers) (for filing).	
2049	5 x 7, per 100	.35
2050	6½ x 8½, per 100	.60
2051	8 x 10, per 100	.65
2052	10 x 12, per 100	1.35
2053	11 x 14, per 100	1.80
2054	14 x 17, per 100	2.25
2060	Foil, Lead, for X-ray Protection in Treatment, per lb.	.50
2061	Lead Glass Protective, Regular Plate Sizes, per sq. inch	.05
2062	Interval Timer	8.00
2063	Benoist Penetrometer	3.00
2064	Films, Eastman Dupli-Tized, Size 5" x 7" with envelopes, per dozen	1.25
2065	Films, Eastman Dupli-Tized, Size 6½" x 8½" with envelopes, per dozen	2.00
2066	Films, Eastman Dupli-Tized, Size 8" x 10" with envelopes, per dozen	2.85
2067	Films, Eastman Dupli-Tized, Size 10" x 12" with envelopes, per dozen	4.50
2068	Films, Eastman Dupli-Tized, Size 11" x 14" with envelopes, per dozen	5.55
2069	Films, Eastman Dupli-Tized, Size 14" x 17" with envelopes, per dozen	8.75
2071	Coolidge Dental Tube Holder, Bracket Type, (Stereoscopic)	85.00
2072	Coolidge Bedside Tube Holder, Bracket Type, (Stereoscopic)	85.00
2081	Automatic Time Controller for Coolidge Bedside Unit (Cabinet Type)	50.00
2082	Automatic Time Controller for Coolidge Bedside (Portable Type)	50.00
2083	Automatic Time Controller for Coolidge Dental Unit	50.00
2084	Campbell Coolidge Clinical Unit Coil, Metal Cabinet, 3, 4 and 5" gap, 0 to 30 m/a, A. C.	680.00
2085	Developing frame for Eastman Dupli-Tized Films	1.50
2086	Clinix—Self-Excited—Tube-Tilt Table, Motor Driven, with Screen, no Stand	2200.00
2087	Clinix—Self-Excited—Tube-Tilt Table, Motor Driven, with Screen and No. 6 Stand	2500.00
2088	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 5 x 7	15.00
2089	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 8 x 10	32.50
2090	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 10 x 12	50.00
2091	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 11 x 14	65.00
2092	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 14 x 17	100.00

(For Cassette prices, see Catalog Numbers 1053 to 1057, inclusive.)

2093 ....
2094 ....
2095 ....
2096 ....
2097 ....
2098 ....
2099 ....
2100 ....
2101 ....
2102 ....
2103 ....
2104 ....
2105 ....

...........$ 3.50
.... 3.50
.... 3.50
.... .75
.... .75
.... .75
.... 2.25

.... 10.00
.... 6.00
.... 25.00
.... 40.00
.... 45.00

.... .35
.... .60
.... .65
.... 1.35
.... 1.80
.... 2.25

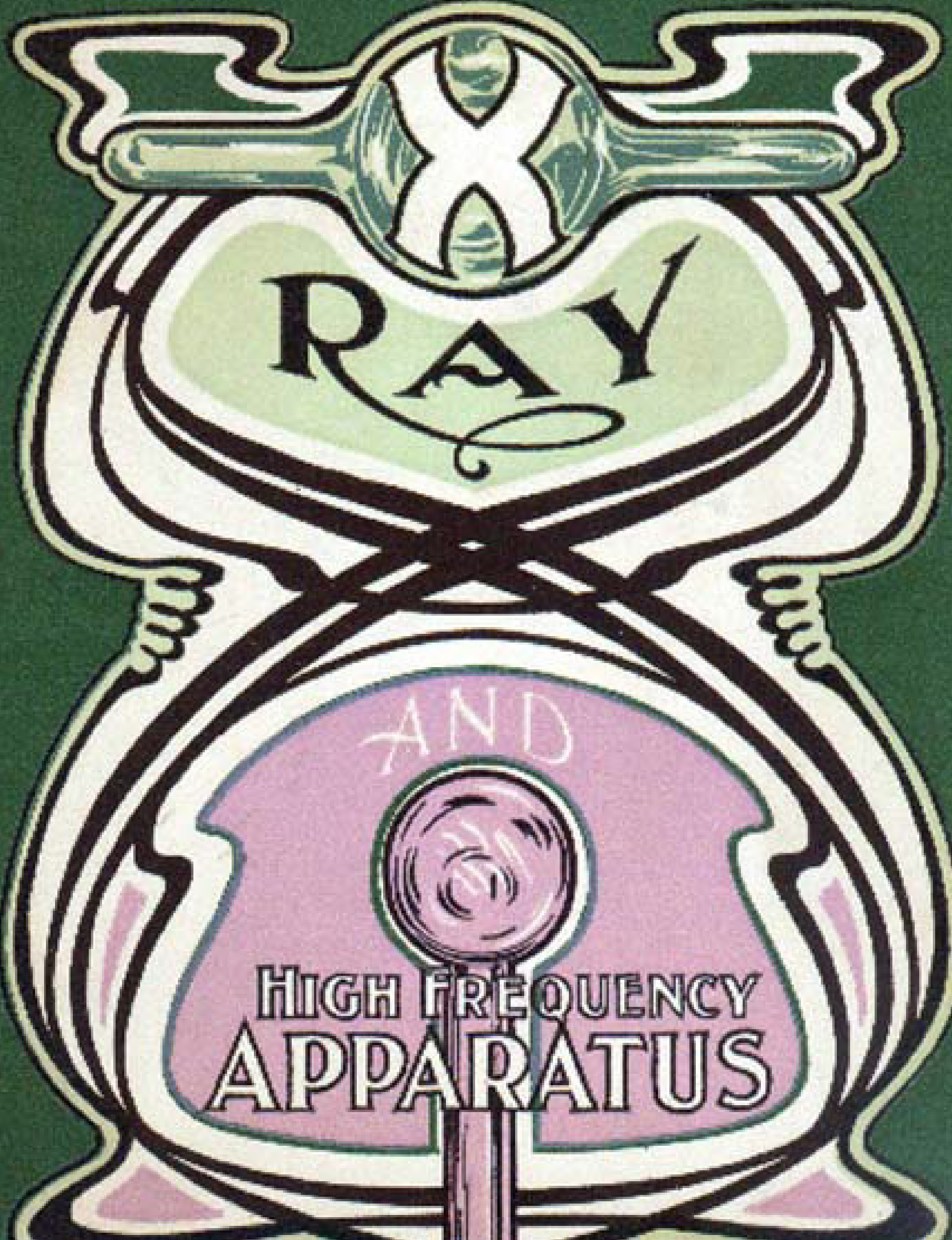
.... .50
.... .05
.... 8.00
.... 3.00
.... 1.25
.... 2.00
.... 2.85
.... 4.50
.... 5.55
.... 8.75
.... 85.00
.... 85.00
.... 50.00
.... 50.00
.... 50.00
0 m/a, A.C. 680.00
.... 1.50
Stand.... 2200.00
No. 6 Stand 2500.00
lms, 5 x 7 15.00
lms, 8 x 10 32.50
lms, 10 x 12 50.00
lms, 11 x 14 65.00
lms, 14 x 17 100.00

ive.)

NUMERICAL LIST

2093 ....
2094 ....
2095 ....
2096 ....
2097 ....
2098 ....
2099 ....
2100 ....
2101 ....
2102 ....
2103 ....
2104 ....
2105 ....

CAMPBELL



X RAY AND HIGH FREQUENCY APPARATUS

MANUFACTURED BY

CAMPBELL ELECTRIC CO.

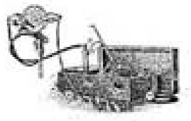
Lynn, Massachusetts, U. S. A.

X RAY HIGH FREQUENCY APPARATUS

CAMPBELL ELECTRIC CO.
LYNN, MASS.
TRADE MARK REGISTERED

Campbell X-Ray and High Frequency Apparatus

IS STANDARD OF THE WORLD



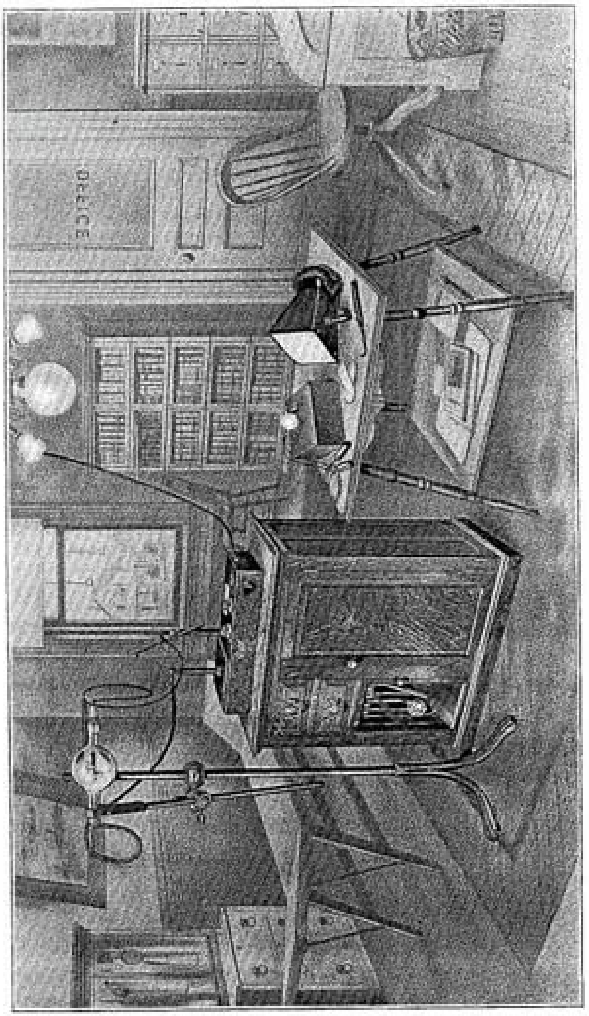
IT HAS NO PEER

MANUFACTURED BY

CAMPBELL ELECTRIC COMPANY
LYNN, MASSACHUSETTS, U. S. A.

Catalogue No. 29 *July 1, 1908*

Copyrighted, 1908, by Campbell Electric Co.



MODERN OFFICE EQUIPMENT.

INDEX

As to the value of X-Ray and High Frequency equipment from an *investment* point of view
See pages 23, 24, 28

Value of the X-Ray for *diagnosis*
See pages 4, 9, 11, 13, 14, 23

Therapeutical value of High Frequency currents,
See pages 6, 7, 8, 14, 27
and our book "Practical Electro-Therapeutics"

Technique . . . . See pages 11 to 14
and our book "Practical Electro-Therapeutics"

If you are not familiar with electrical apparatus and are afraid that to master it would be difficult and consume much of your time, ... See pages 11 to 13

As to the best apparatus for you to purchase,
See pages 4, 12, 13, 23 to 28
or ask any one of our customers whom you will find in every state in the United States and in foreign countries.

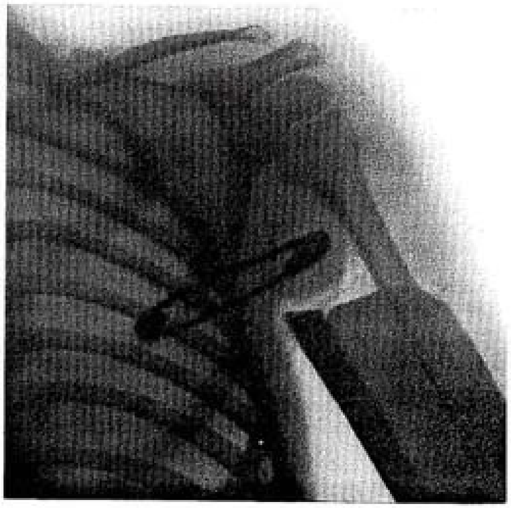
Complete outfits are listed on, . . . Pages 19, 20, 21, 22

Specifications of apparatus, ... Pages 15 to 18

Price List Summary, ... Page 18

Campbell Apparatus absolutely guaranteed against inherent defect

RADIOGRAPH MADE WITH A CAMPBELL COIL.



Shows bone through tin splint

A prominent Massachusetts surgeon who is using a Campbell Coil says:

"The Coil is doing splendid work, both in High Frequency and X-Ray. It has been in use nearly five years and to-day is in perfect condition. I freely recommend it to my friends, without reserve, knowing what it will do, and also knowing that your company will do just as they agree."

THE AGE OF ELECTRICITY

(READ AND LEARN)

Historians and writers on political economy make an arbitrary division of epochs into certain ages which take their names from the material or force which has played the most important role in the world's development at any given time. Commencing with the stone age, we have gone up through the scale, — Copper, Bronze, Iron, Steel, etc. Within the memory of many of us we have advanced from the age of Steam to the *Age of Electricity*, in which we are now living.

Although electrical energy has been recognized for a long time, it is only within a comparatively short period that it has been commercially useful, but, within the last quarter century especially, it has become the chief servant of man in many of the arts and sciences, and today, were we to be suddenly *deprived* of its use, the world would come to a standstill.

It was *early* surmised that electricity would have an important part in the armamentarium of the physician, and more than a *hundred years* ago Franklin made a number of experiments upon the human subject with the static spark and several of the other static modalities. Following the discovery of the Galvanic and the Faradic currents, they in turn were brought into use within the field of medicine. For various reasons the use of electricity in the practice of medicine was limited for a long time to two classes of practitioners, the specialist who had given much time and study to the matter, and the charlatan who had given little or no study, but depended upon the credulity of his victims and the tendency of human nature to regard with veneration, almost superstition, that which is more or less mysterious. As a result the general run of practitioners either openly confessed that they knew little or nothing of the subject, or, "damned it with faint praise," even in cases condemning it. As a proof of this, look within the pages of your standard work on nervous diseases, issued twenty-five years ago.

Such was the status of electricity in medicine *twenty-five* years ago. Suddenly there was published throughout the world the wonderful *discovery of the X-Ray*. This discovery not only opened up a new field of usefulness, but also gave a wonderful impetus to electro-medical science, which otherwise might not have been attained in a century of ordinary progressive development. It was soon discovered that to make the X-Ray of practical value the exciting apparatus must be rendered more powerful, that a generating apparatus of high potential was a prime requisite. This led to the development of the static machine, and within a few years the market, both Continental and American, was flooded with all sorts and descriptions of static machines. At about the same time was developed the use of the static as a producer of therapeutic currents, and a heretofore little used apparatus came into more or less general use. The use of this machine as an exciter of X-radiance, however, soon showed its limitations. A small static machine was totally inadequate and the large expense of a more powerful one was prohibitive as far as its use by the general run of practitioners was concerned. It soon became evident that in addition to a high *potential* there was needed an increased *volume* of current to bring the use of the X-Ray tube to its highest efficiency. The limit of possibilities in the development of the static was soon reached, and still the production of a radiance sufficient to render possible the making of a plate within a reasonable time of exposure, save in the case of thin portions of the body, or the thicker portions of a thin subject, had not been attained. Following the general law of economics, this necessity stimulated the discovery of the required means, and the result was the *coil*. The constant pressure brought to bear by the demand of operators for more perfect and more powerful apparatus wonderfully stimulated the activity of the manufacturers, and the evolution of the coil to its present state of perfection has been wonderfully rapid.

The direct offspring of the coil was the *high frequency current*, and with its discovery the position of electricity in medicine took an entirely new importance. Advanced thinkers in the field of medical research bent all their energies to the development of perhaps the most important discovery of the century, and the wonderful new remedial agent was soon adapted to the intelligent and effective use of the profession.

High Frequency currents and the X(Roentgen) Ray are now recognized as standard therapeutic agents. Their immediate application is simple and easy. The results approach the miraculous, almost beyond belief; indeed belief would be impossible were the report of wonderful and unexpected results not backed up by the undoubted reputation of the men who are making them the world over.

Many physicians and surgeons have suddenly come into prominence, have found themselves advanced at a leap from comparative mediocrity to a position of authority, and, as a secondary but by no means less gratifying result, have advanced from a condition of more or less precarious *income* to one of competence.

Such successes have been possible because these men have been quick to see the possibilities of Electro-Therapy. They foresaw the trend of the age, — prognosed the case, as it were.

The success of every intelligent physician who adopts Electro-Therapy is just as certain. The great field has been only entered by the pioneers. A wide variety of affections, as diverse as the patients, presents unlimited opportunity for the development of Electro-Therapeutics.

The *trend of the age is electrical* and practical. Electric cars have displaced the horse car because they are more rapid and more practical; in the same manner the telephone has superseded the messenger boy; electric lights the other illuminants; in short, more rapid and precise methods are succeeding the cruder methods of past years. The same is true in the medical field. There is a reaction from the excessive use of drugs, which today play a subordinate rather than a leading part in the daily routine of the physician. Much more thought is being given to the question of sanitation, hygiene, dietetics, suggestive methods of treatment and divers mechanical and physical methods. Among these newer methods of treatment no single means of therapeutic application has received so much attention among the profession, or been so *widely exploited among the laity* as the modern scientific application of the newer and more powerful electrical currents, and the physician

who *ignorantly* or *willfully ignores* this fact is *behind the times*, doing injustice not only to his patient but to himself.

The older forms of electrical treatment by means of the galvanic or faradic current were extremely local in their effect, depending largely for their efficiency upon exact application to definite nerve areas, and when so applied more or less superficial and limited in their effect. Each was capable in unskillful hands of producing not only no relief of existing conditions, but even actual harm to the patient. Their intelligent and effectual use demanded more time and special study than could well be given by the general practitioner and as a result was limited to a comparatively few specialists competent to use them, and we fear to another class, of practitioners in whose hands their chief function was to produce a strong mental impression upon the patient, with little or no knowledge of, or regard to, the actual physical effects.

With the introduction of the *High Frequency Currents* all this became changed. This form of treatment is *real*; it is *definite*, it is *scientific*. It goes immediately to the *seat* of trouble, it reaches the nerve centres, stimulates nutrition, promotes metabolism and puts new life into the patient. Its field of usefulness is apparently limited only by the actual number of abnormal conditions. With this increased field of usefulness the installation of some form of High Frequency Apparatus becomes *not only a convenience* but almost a *necessity* to the general practitioner. He is almost compelled to do this in self protection. In these days people are reading and thinking for themselves. The current literature of the day as well as the lay press is more or less filled with reports of wonderful results obtained by the use of the X-Ray and the H.F. currents. With the usual propensity of the lay writer to mangle and distort all medical topics, many of these articles are more or less amusing to the medical reader, but nevertheless there is in them so much of actual truth that even the medically educated man is fain to put more or less credence in them, and *what must be the impression on the lay mind?* Your patients will read, they will receive the reports of friends, they will desire to try the new treatment and will come to you, if they are loyal, asking for it. You can do one of *three things*, administer the treatment yourself, refer them to some one who will administer it, or talk them out of it. *Which course* will produce the best effect upon your patient and which course is most likely to result favorably to yourself?

Verifying the statement as to the attitude of the press in general, here are a few clippings:

Here is a report of "X-Ray sure cure for Appendicitis" telegraphed all over the world by the Associated Press:

New York—By accident Dr. Charles Harvey Archibald of this city has learned that appendicitis yields to the X-ray. He declares he has cured many cases in his private practice, and today publicly announced this discovery and offered to prove its worth before medical experts.

When an appendicitis patient comes into Dr. Archibald's office the physician places the sufferer in front of a Roentgen machine. Then he trains the powerfully penetrating ray upon the sore spot. Soon the swelling is reduced and the pain stopped. Five or six days later, after from four to six "applications," Dr. Archibald says a cure is effected.

"The new cure is so childishly simple that I would have never come upon it except by the merest luck," the physician said. "It is nothing more or less than the process of bombarding the congestion about the appendix with violet electric rays. The treatment causes the blood to return to the central circulating system."

Another article reprinted from the New York Medical Journal in big Sunday papers in the leading cities of the United States with the alluring headlines "Making New Blood with Electricity":

Sir James A. Grant, physician to Earl Grey, governor-general of Canada and consulting physician to the Montreal General and St. Luke's Hospitals, announced recently in an article in the New York Medical Journal that blood can be made by electricity, and that persons suffering from anemia can be benefited greatly thereby.

"An important fact, demonstrated clearly," says Sir James in his article, "is that blood can actually be made by electricity, by stimulating through the abdominal walls the ganglia that take part in the process of blood formation."

"For many years," he explains, "I applied electricity in the ordinary way, frequently with beneficial results, without knowing exactly the why or the wherefore. As the body is largely composed of water, holding in solution salts of potash and soda, it becomes an excellent electrolyte. In no part of the human system are the irregularities of life more marked than in the alimentary canal, where the defences of the organism permit the ingress of bacterial toxins. In this tract the blood becomes interrupted. Under such circumstances a perfectly stable nervous system is a rarity. Here particularly electrolysis becomes an important factor, giving new activity by establishing beyond doubt an average neuro-physic equilibrium."

He then introduces the passage quoted above about making blood. Among the cases cited is that of a man 71 years old, who had suffered for a number of years from muscular weakness and general debility.

"Electrolytic treatment through the solar plexus," he says, "given every second day for three weeks, brought about an entire change for the better. The patient now walks with ease and comfort and his face regained its red color."

"To Keep Young and Feel Young Always" is the heading for a full page article, elaborately illustrated, in a series of Sunday papers including all the large cities of the United States. It was reprinted by such serious papers as the Boston Transcript as follows:

(*Boston Transcript*)

A method of retarding the approach of old age by treatment with high-frequency electric currents is reported in The Medical Times (New York), by Dr. Samuel G. Tracy of New York. In Dr. Tracy's opinion, senility is a natural process, and should come on gradually and painlessly. Owing to inheritance or predisposition, as well as to the strenuous modern life, it creeps up before we are aware of it, and this is the time for the physician to protect his patient. When a man begins to get old, says Dr. Tracy, much can be accomplished to retard the symptoms. He goes on:

"It is admitted by many of our profession that arteriosclerosis (with loss of elasticity in the walls of the arteries) is really the beginning of old age The changes in the wall of the blood vessel are said to be due to hypertention and vitiated blood. The condition of the blood is due to autoinfection and the floating in the blood-stream of waste material. The waste material found in the blood is due to overeating, excessive drinking of alcohol, and autointoxication. In the latter case the chemistry of the system is unbalanced. . . . There is more waste than repair; the organs which preside over elimination of waste material being overtaxed are unable to efficiently take care of the excess, and consequently some waste material floats in the blood-stream, acting as a poisonous substance, vitiating the 'rivers of life' and degenerating the 'river beds.' . . . When arteriosclerosis has manifested itself by hypertention in the blood vessels, strong emotions, excessive mental excitement or physical strain is likely to endanger life by a sudden rupture of a small vessel in the brain. . . . An artery of the body can be compared with a flexible rubber tube, used for a drop light, and filled with illuminating gas. Continual overpressure of gas within the tube will affect the walls of the tube, and diminish its elasticity. If the tube is slightly damaged or obstructed, increased pressure of gas may cause a fissure in the inner wall of the tube. To make the tube do good practical work it is absolutely necessary to moderate the pressure of the gas. So it is with our arteries. When arteriosclerosis first makes its appearance we must reduce the pressure in the blood vessel. While old age cannot be prevented, we have agencies at our disposal which will materially assist in retarding it, and in making its symptoms more comfortable. These agencies are *high-frequency electric currents*, diet and hygiene. The physiological effects of a high-frequency current are due to the spark, or condenser effect, which produces mechanical effect on the tissue, an increased heat in the body, and the formation of ozone and ultraviolet light. The local action is accomplished by a general reaction, the blood pressure is lowered, and combustion through the lungs is increased. The eliminative processes are generally stimulated."

It is claimed that very interesting results are obtained by the use of such high-frequency treatment, combined with proper diet and hygienic precautions.

WOULD USE X RAY TO TELL AGE OF CHILDREN

Plan is Advocated by Dr Rotch, Who Declares That Chronological Age is Not Modern and Must Disappear

In the near future, when the child goes to school, the teacher, instead of asking its age, will have the X-Ray turned upon its wrist and then place the little one in one of three class divisions, A, B or C, according to the bone development which is seen there. That at least is the plan which Dr. Thomas Morgan Rotch, a prominent Back Bay physician, wishes to see put into practice when he has finished his investigations on the subject. At the Children's Hospital he has been working on this for six months and has examined about 400 children. "Chronological age," he said in his lecture on 'The Sick Child' at the Harvard Medical School yesterday afternoon, "must disappear. It is not modern.

"Investigations show that we do not know how old children are. Take a child chronologically 10 years old. He may really be anatomically 9 or 11 years old. Which age he is can be told by an X-Ray examination of the wrist. By-and-by when children go to school they will be placed according to their anatomical age discovered by the X-Ray."—*Boston Globe.*

In addition to the lively interest taken by the lay press, note the rapidly growing space given to electricity in the leading medical journals. The foregoing are only a few things that help to prove that, not only in other lines but also in the *medical world*, we are living in the *Age of Electricity*.

RADIOGRAPH MADE WITH A CAMPBELL COIL.

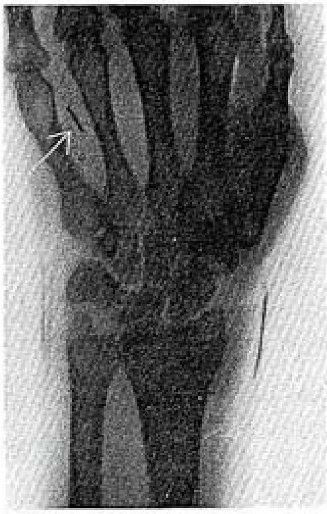


Plate made for fracture of wrist. Needle discovered in hand which patient did not know was there.

If you have a Campbell Coil, the following currents are at your disposal:

High Frequency varying in intensity and volume from a current with frequency of alternation and voltage up to the hundreds of thousands, and of such minute volume that it may be applied to the eyelid without perceptible sensation other than a slight degree of warmth, or may be used on the most sensitive mucous membrane, down to a coarse current of a few thousand alternations that will discharge from the vacuum electrode a bombardment of sparks beyond the requirements of clinical work.

Sinusoidal An alternating current with the additional quality of varying strength or pulsations, producing variation of stimulating effects that can be obtained by changing the volume and force of flow of current.

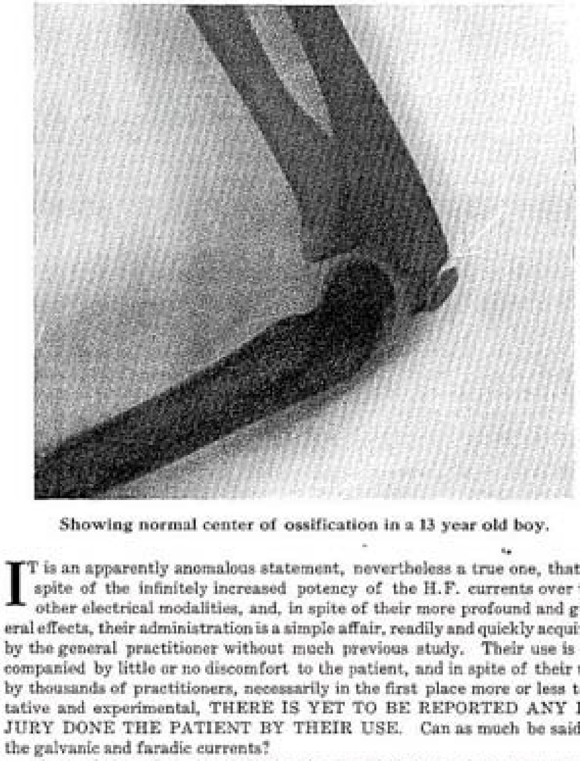
Thermo-Faradic So called because by its use the sensations peculiar to the faradic coil are received, but, as it is a high frequency current it is possible to use a much higher voltage, therefore a large amount of current can be applied with a resultant sensation of warmth. This current can be varied between 1000 and 4000 volts.

D'Arsonval takes its name from Professor D'Arsonval of the Institute of France who formulated its effects and demonstrated their value in electro-therapeutics. It is like the Thermo-Faradic current, of high frequency and power, but of higher voltage (up to 15,000) giving a very energetic vaso-motor constriction.

Cautery The use of the electro-cautery is already so well known that we need only to say, that as a producer of cautery current the Campbell Coil has no superior. This current is of a low voltage and is also very valuable for operating diagnostic lamps.

X or Roentgen Ray The wonderful importance of this form of transformed electricity and its varied use, not only in anatomical photography but in therapeutics has been recognized for more than a decade, and to the accurate and scientific use of this potent agent much thought and study has been given on both sides of the ocean. With the advent of the X-Ray the treatment of cutaneous and malignant affections was revolutionized and, although all the early hopes with regard to overcoming of the dread cancer have not been fully realized, enough cures have been reported to make it still the best single means of treatment. Incidentally there has been demonstrated its unequalled value in the treatment of numberless cutaneous and glandular disturbances, certain forms of nervous disturbance and abnormal blood conditions. Its value as a means of physical diagnosis simply needs to be mentioned in passing.

RADIOGRAPH MADE WITH A CAMPBELL COIL.



Showing normal center of ossification in a 13 year old boy.

IT is an apparently anomalous statement, nevertheless a true one, that in spite of the infinitely increased potency of the H.F. currents over the other electrical modalities, and, in spite of their more profound and general effects, their administration is a simple affair, readily and quickly acquired by the general practitioner without much previous study. Their use is accompanied by little or no discomfort to the patient, and in spite of their use by thousands of practitioners, necessarily in the first place more or less tentative and experimental, THERE IS YET TO BE REPORTED ANY INJURY DONE THE PATIENT BY THEIR USE. Can as much be said of the galvanic and faradic currents?

Granted that there is a field for the use of X-Ray and H. F. currents, that their use by the profession generally is practicable and feasible, it is our desire to show you that we are putting out an apparatus that will not disappoint you and that will meet your requirements in every way.

With the advent of a comparatively new type of apparatus into any field it is a necessary result that the earlier efforts are more or less crude, and that with use develop defects. The result is, either improvement of apparatus, or the substitution of an entirely new type or principle. Our coil is not in the experimental stage;—in fact it never was, outside of our own laboratory! We put our apparatus on the market years ago as a practical and simple coil, and more important still, at a moderate price. Hundreds of them have been sold and they are working to-day. This demonstrates two facts, practicability, and durability. Such changes as have been made from time to time in our apparatus are more in the way of increased compactness and convenience of handling rather than any departure from the principles of construction which we adopted in the first place. We *proved* its capabilities and limitations *at our own expense* and *not* at the expense and annoyance of our *patrons*. Perhaps you have helped test out some experiment in the coil line, weighed it and found it wanting. If not you are fortunate. Others have! *We offer you a tested and proven success.*

The Campbell coil is in size a little smaller than an ordinary dress suit case but don't judge its capability by its size. It is all kernel with just enough shell to cover it. We could have spread out its various windings and switches to fill a case as large as an upright piano, thereby doubling the selling price without adding one iota of value to its efficiency. Such coils have been made and sold. Have you seen them? One thing they accomplish. Possibly the impression on the patient is a little more awe inspiring. We have catered to the desire for a more imposing apparatus by designing our cabinet in which the ordinary coil may be set and become an apparent inseparable part of a rather handsome piece of office furniture. But, it retains the portable feature and at a minute's notice, can be removed, covered, put into your buggy, or automobile and taken *to the bedside* of your patient. It was the *first portable coil* capable of doing satisfactory X-Ray work at the home of the patient which could be attached to an ordinary electric light socket on a commercial current. CAMPBELL X-RAY AND HIGH FREQUENCY APPARATUS IS TODAY THE BEST APPARATUS OF THIS TYPE ON THE MARKET.

The majority of High-Frequency Coils are practically useless as a producer of X-Rays sufficiently penetrating to make them available for any but superficial work, and then, with a time of exposure approaching that of the discarded static. Two principal causes contribute to this condition. The H.F. current is an alternating current, while the current producing the X-Ray must be unidirectional; therefore one-half the phase of the alternating current is useless — worse than useless — for it produces in the *ordinary* tube a confusion of radiance which makes the production of a satisfactorily clear image next to impossible. A second cause was the failure to take into consideration a certain simple but important principle of construction upon which the production of efficient X-radiance depends. This principle we embodied in our coil from the start, and our early trouble was not insufficiency of ray producing current but to find a tube that would take the output of our coil at its maximum efficiency. This problem has been solved, and we have today several types of tube that are so constructed that the reverse ray is entirely choked, and of sufficient heat absorbing power to stand our maximum current for an interval of time equivalent to the longest necessary exposure.

With any apparatus, the making of a good radiograph is a matter that requires no little amount of skill and judgment on the part of the operator, and, with the most reliable of standard direct current coils, in the hands of skilled operators not every exposure means a resultant satisfactory plate.

Let us tell you what our coil of standard model, sold from stock some three years ago, has done and is still doing. It has made a plate of an adult hip in three minutes, giving good definition of the head of the femur and the acetabulum, and in the hands of the same operator has made some twenty hip plates in subjects varying from a child to a man of 350 pounds. In no case has there been a failure, and the maximum exposure in any case was six minutes, the average about five. In but two cases was a second trial necessary and these were both over-weight adults. It is making plates of the wrist, clearly showing the medullary canal of the long bones, cancellar structure and the distinct diagnosis of a crack without displacement; this in from ¾ to 1½ minutes. Foot and ankle in from 1 to 2 minutes; knee 1½ to 3 minutes; elbow 1½ to 3 minutes; shoulder 2 to 4 minutes. It has made dental radiographs distinctly showing nerve channel in one minute, and we believe it will do this every time. Much of this work has been done at the home of the patient, and so certain were probable satisfactory results that the entire apparatus has been taken home before development of the plate, and in but one instance was it necessary to repeat the exposure. This is what has been done and what you can do. It is not necessary to state that its efficiency as a producer of radiance for therapeutic purposes is in direct proportion to its radiographic power.

To resume then, in bringing our coil to your attention we offer you a tested and tried apparatus, long past the period of experiment and unknown efficiency, simple and durable in its construction, transformable into its various capacities in a small fraction of a minute, without complicated array of switches, everything for service and nothing for show. Its price is less than that of other types of apparatus which are available for high frequency alone, and you receive with this, absolutely *without cost*, an *X-Ray apparatus* which in definition and clearness of radiographs competes with direct current coils of double its price, avoids the dirt and bother of the mercury jet or electrolytic interrupter, and requires no care outside of dusting, and possibly once in several months a rubbing up of the surface of the spark-gap with a fine emery cloth.

It requires no special wiring or fusing of circuit and at its maximum output draws from the circuit *one-third or less* of the *current* that must be put through an electrolytic interrupter *before there is any current delivered to the coil.* It is absolutely guaranteed against breakdown, and is practically proof against careless or ignorant handling; to speak in the vernacular, "it is fool proof."

IF YOU *HAVE* A SATISFACTORY PRACTICE CAN YOU AFFORD TO BE WITHOUT THIS UP-TO-DATE *ADJUNCT* TO YOUR *EQUIPMENT?* IF YOU HAVE **NOT** A SATISFACTORY PRACTICE **CAN YOU AFFORD TO BE WITHOUT THIS MEANS OF ACQUIRING IT?**

Campbell

X-RAY and HIGH FREQUENCY APPARATUS

FOR
PHYSICIANS—HOSPITALS—DENTISTS
AND
INDUSTRIAL PURPOSES

6615

OFFICIAL
AWARD
RIBBON
PANAMA-PACIFIC
INTERNATIONAL
EXPOSITION
SAN FRANCISCO
1915
MEDAL
OF
HONOR
DEPARTMENT OF
LIBERAL ARTS

MEDAL OF HONOR

HIGHEST
AWARD

PANAMA-PACIFIC
INTERNATIONAL
EXPOSITION
SAN-FRANCISCO
1915

Surex
CAMPBELL ELEC CO LYNN MASS

Campbell

X-RAY and HIGH FREQUENCY APPARATUS

FOR
PHYSICIANS—HOSPITALS—DENTISTS
AND
INDUSTRIAL PURPOSES

6615

OFFICIAL
AWARD
RIBBON
PANAMA-PACIFIC
INTERNATIONAL
EXPOSITION
SAN FRANCISCO
1915
MEDAL
OF
HONOR
LIBERAL ARTS

MEDAL OF HONOR

HIGHEST
AWARD

PANAMA-PACIFIC
INTERNATIONAL
EXPOSITION
SAN-FRANCISCO
1915

Surex

CAMPBELL ELEC CO LYNN MASS USA

Campbell Electric Co.
Lynn, Mass.

PRICES IN EFFECT SEPTEMBER 1, 1920

Which supersede prices listed in all catalogues
issued to date and made necessary to
PRESERVE QUALITY

CAMPBELL ELECTRIC COMPANY
CAMPBELL ELEC. CO.
CAMPBELL ELECTRIC COMPANY

LYNN, Mass. "The Plant That Serves You" 1920

CAMPBELL ELECTRIC COMPANY

LYNN, MASSACHUSETTS

Prices in Effect September 1, 1920

ALPHABETICAL LIST

Cat. No.		Prices
1076	Aerial System (Overhead Trolley), consisting of 2 Wall Boards, 3 Wall Insulators with Turnbuckles, 3 Wall Insulators without Turnbuckles, 80 feet Trolley Wire, 1 Trolley Reel with Wheels, and 1 Coolidge Tube Reel	$ 50.00
	Individual Parts. (For Aerial System.)	
1067	Wall Insulator (Strain) without Turnbuckle	4.00
1068	Wall Board	3.00
1069	Wall Insulator (Strain) with Turnbuckle	4.50
1070	Trolley Wire, per foot	.05
1071	9 feet Cord Reel, with Wheels	6.00
1072	Trolley Wheel	3.00
1073	Coolidge Tube Reel, with Trolley Wheels	10.00
1074	2 foot H. T. Insulator Tubes for Connecting Rooms	7.50
1075	Aerial H. T. Switch, complete	40.00
2045	Ammeter, for Coolidge Filament Transformer	30.00
2012	Angle Indicator	7.00
1090	Apron, X-ray Protective	15.00
1150	Army (U. S.) Manual	4.00
1583	Atomizer	3.50
1528	Auto Condensation Pad, with Cords	20.00
1007	Auto Condensation Chair, with Leg Section (Head Section $15 extra)	85.00
	Bedside Units, See Coolidge Clinical and Clinette Units.	
2062	Benoist Penetrometer	4.00
1512	Cabinet for Model "E" Coil or Clinette Portable Coolidge Unit	30.00
1574	Cautery, Blade only	2.00
1573	Cautery, Handle and Blade	6.50
1053	Cassette, 5 x 7 (For Intensifying Screen)	12.00
1054	Cassette, 8 x 10 (For Intensifying Screen)	15.00
1055	Cassette, 10 x 12 (For Intensifying Screen)	18.50
1056	Cassette, 11 x 14 (For Intensifying Screen)	22.00
1057	Cassette, 14 x 17 (For Intensifying Screen)	24.00
2097	Centering Rod for No. 6 Tube Stand	7.50
1007	Chair, Auto Condensation, with Leg Section (Head Section $15 extra)	85.00
	Chemicals (Photographic). (See Dark Room Supplies.)	
	"Clinix"—Self-Excited—Tube-Tilt Table—See Tables.	
	Coils	
2084	Coolidge Clinical Metal Cabinet Type, 3, 4 and 5" Gap, 0 to 30 M/A, A. C.	680.00
1592	Coolidge Clinette BEDSIDE, Portable Type, 0 to 30 milliamperes, 3" to 5" Spark Gap, Rheostat Control (Single Unit), A. C.	540.00
1593	Separate Auto Transformer Control for Clinette Portable Coil (Double Unit)	100.00
1200	Coolidge DENTAL, Cabinet Type, A. C., 60 Cycle	600.00
1511	Model "H", A. C., 50 to 60 Cycle	150.00
1509	Model "E", A. C., 50 to 60 Cycle	300.00
1504	Model "I", A. C., 50 to 60 Cycle	500.00
1505	Model "I", A. C., 50 to 60 Cycle with Pump	650.00
	Cones	
1020	No. 5A	14.00
1021	No. 5B	17.00
1016	No. 6A	14.00
1017	No. 6B	17.00
1018	No. 6C	14.00
1019	No. 6D	14.00
1518	No. 12A	10.00
1519	No. 12B	10.00
	Coolidge Tubes	
1022	Fine Focus	125.00
1023	Medium Focus	125.00
1024	Broad Focus	125.00
1270	Bedside, Radiator Type (Indicate whether 10 or 30 m/a)	125.00
1029	Dental, Radiator Type	125.00

ALPHABETICAL LIST

25	Coolidge Tube Filament Transformer with Control, A. C. (Specify Voltage)	$85.00
15	Coolidge Tube Ammeter for above Transformer	30.00
	Coolidge Units—Outfits.	
4	Clinical Coil, Cabinet Type, Mahogany finish, A. C., 50 to 60 Cycle (Will operate either 10 Milliampere or 30 Milliampere Tube with 3, 4 and 5" Gap.)	680.00
1	Tube-stand, Counterweighted, Stereoscopic	190.00
7	Foot Switch, with Cable and Plug	30.00
9	Tube-shield, Lead Glass	25.00
0	Coolidge Radiator Bedside Tube	125.00
	Outfit Complete	**1050.00**
1	Extra for Automatic Time Controller	60.00
	Extra for use on 110 V. D. C., 10 Milliamperes	150.00
2	Bedside Coil, Clinette Portable Type, 0 to 30 Milliamperes, 3" to 5" Spark Gap, Rheostat Control (Single Unit), A. C., 110 Volt	540.00
	Separate Auto Transformer Control for Portable Coil (Double Unit)	100.00
	Tube Holder, Adjustable Bracket Type	60.00
	Tube-shield, Lead Glass	25.00
	Coolidge Radiator Bedside Tube	125.00
	Outfit Complete (Single Unit)	**750.00**
	(Double Unit)	**850.00**
	Extra for Stereoscopic Tube Holder (Catalog No. 2072)	35.00
	Extra for Automatic Time Controller	60.00
	Extra for use on 110 V. D. C., 10 Milliamperes	150.00
	Dental-Coil, A. C., 50 to 60 Cycle, Wood Cabinet, Mahogany Finish	600.00
	Dental-Coil, A. C., 50 to 60 Cycle, Metal Cabinet, Mahogany Finish	600.00
	Tube Holder (Adjustable Bracket Type)	60.00
	Foot Switch, with Cable and Plug	30.00
	Tube-shield, Lead Glass	35.00
	Coolidge Radiator Dental Tube	125.00
	Outfit Complete,	**850.00**
	Extra for Stereoscopic Tube Holder (Catalog No. 2071)	35.00
	Extra for Automatic Time Controller	60.00
	Extra for use on 110 V. D. C.	100.00
	Coolidge Tube Reel	8.00
	Coolidge Tube Reel, with Trolley Wheels	10.00
	Control Table for No. 12 SureX, instead of switchboard attached, difference extra	200.00
	Cords	
	Connecting Cord, with Plugs	3.00
	Heavy Cable, with Hook	2.00
	Light Cable, with Hook	1.50
	Cautery Cords (pair)	1.50
	Bifurcated Cord	1.50
	Treatment Chair Cord	1.50
	Cord Reels. (See Reels.)	
	Dark Room Supplies	
	Developing Tank, stone	75.00
	Developing Tank, plate racks, each, 5 x 7	2.00
	Developing Tank, plate racks, each, 6½ x 8½	2.00
	Developing Tank, plate racks, each, 8 x 10	2.00
	Developing Tank, plate racks, each, 10 x 12	2.00
	Developing Tank, plate racks, each, 11 x 14	2.50
	Developing Tank, plate racks, each, 14 x 17	2.50
	Developer, Eastman X-ray, ½ dozen packages (each makes 12 oz.)	.90
	Fixing Powder (makes 64 oz.)	.25
	Hard Rubber Fixing Box	18.50
	Graduate, 8 ounces	.55
	Graduate, 16 ounces	.75
	Drying Rack	2.50
	Mortar and Pestle	.60
	Ruby Lamp and Illuminator, 7" x 9" Ruby—5" x 8" White	12.00
	Balance Scales	5.00
	Thermometer Stirring Rod	1.00
	Interval Timer (For Timing Development)	8.00
	Trays, 8 x 10	1.50

ALPHABETICAL LIST

	Dark Room Supplies	
1129	Trays, 10 x 12	$3.
1130	Trays, 11 x 14	4.
1131	Trays, 14 x 17	6.
1132	Wash Box to hold 14 x 17 Plates	12.
	(See Films and Plates.)	
	Dental Units, see Coolidge Units	
2046	Developing Cabinet (Portable Dark Room)	45.
2047	Developing Cabinet, with Trays, Films and Chemicals	50.
2985	Developing Frame for Eastman Dupli-Tized Films, each	1.
	Developing Tanks, Developer, etc. (See Dark Room Supplies.)	
1575	Diagnostic Lamp in holder	2.
1576	Diagnostic Lamp Bulb	.
2098	Dosage Indicator, Grover's X-ray	3.
1122	Drying Rack	3.
	Dupli-Tized Films, Eastman, see Films	
	Electrodes. (Glass Vacuum.)	
1530	Plain Electrodes (set with handle)	10.0
1531	Surface Electrode	1.5
1532	Vaginal Electrode	1.5
1533	Rectal Electrode	1.5
1534	Urethral Electrode	1.5
1535	Nasal Electrode	1.5
1536	Throat Electrode	1.5
1537	Electrode Handle	2.0
2096	Blackman Hand Electrode	5.0
2015	Dental Electrodes (set with handle)	12.0
2016	Dental Surface Electrode	1.75
2017	Dental Cavity or Pulp Tester	1.75
2018	Dental Gum	1.75
2019	Dental Pyorrhea	1.75
2020	Dental Cataphoric	1.75
2021	Dental Handle, with Cord	3.50
	Insulated and Miscellaneous Electrodes	
1538	Insulated Vaginal	2.50
1539	Insulated Rectal	2.00
1540	Insulated Urethral	2.00
1541	Insulated Nasal	2.00
1542	Insulated Throat	2.00
1543	Insulated Ear	2.00
1544	Goitre Electrode	2.50
1545	Single Eye Electrode	1.50
1546	Double Eye Electrode	2.00
1547	Cataphoric Electrode	4.00
1548	Condenser	4.00
1549	Block Tin Electrode	.75
1550	Treatment Chair, Vacuum Electrode, each	.75
1551	Treatment Chair, Hand Electrode, each	1.00
1552	Fulguration Electrode Handle, with 2 Electrodes (Extra Electrode 25 cents)	3.50
1553	Moist Electrode, large	3.00
1554	Moist Electrode, small	2.50
1555	Metal Hand Electrode (pair)	.75
1565	Morse Moist Pads (set)	10.00
	Non-Vacuum Electrodes, any kind, each	7.50
	Envelopes (for filing plates) see Plate Containers	
1586	Eustachian Tube Inflator	.50
2100	Exposure Holders for Dupli-Tized Films, 5 x 7 each	.08
2101	Exposure Holders for Dupli-Tized Films, 6½ x 8½ each	.10
2102	Exposure Holders for Dupli-Tized Films, 8 x 10 each	.10
2103	Exposure Holders for Dupli-Tized Films, 10 x 12 each	.15
2104	Exposure Holders for Dupli-Tized Films, 11 x 14 each	.15
2105	Exposure Holders for Dupli-Tized Films, 14 x 17 each	.20
	Films, Dental.	
1105	1¼" x 1¼", per dozen	.50
1106	1¼" x 2¼", per dozen	

ALPHABETICAL LIST

Films, Eastman Dupli-Tized.	
Size 5" x 7" with envelopes, per doz.	$1.25
Size 6½" x 8½" with envelopes, per doz.	2.00
Size 8" x 10" with envelopes, per doz.	2.85
Size 10" x 12" with envelopes, per doz.	4.50
Size 11" x 14" with envelopes, per doz.	5.55
Size 14" x 17" with envelopes, per doz.	8.75
See price list Exposure Holders (for use with films)	
Film Chest, Dental Lead	12.00
Film Clamps, for developing, per dozen	2.50
Film Holders, for Dental Radiography, each	.75
Film Holders, Exposure for Dupli-Tized Films, see Exposure Holders	
Film Illuminator, Dental	7.50
Film Mounts, cardboard, per hundred	4.50
Film Mounts, transparent, per hundred	5.50
Filters, aluminum	
1 mm.	1.00
2 mm.	1.50
3 mm.	2.00
Fixing Powder (make 64 oz.)	.25
Fluoroscope	
5 x 7, Folding	35.00
8 x 10, not Folding	50.00
Fluoroscope Screens	
8 x 10	35.00
10 x 12	52.00
11 x 14	72.00
14 x 17	102.00
Fluoroscope Screen mounted in Oak Frame, with lead glass.	
8 x 10	52.00
10 x 12	75.00
11 x 14	95.00
14 x 17	135.00
Fluoroscopy—Vertical, Horizontal, Angular. (See Tables.)	
Foil. Lead, for X-ray Protection in Treatment, per lb.	.50
Foot Switch, heavy capacity, double contact, to control lamp	45.00
Foot Switch, heavy capacity, single contact	30.00
Gloves, opaque protective (plain)	12.00
Gloves, opaque protective (gauntlet)	15.00
Graduate, 8 ounces	.55
Graduate, 16 ounces	.75
Grover's X-ray Dose Indicator	3.00
Hard Rubber Fixing Box	18.50
High Tension Transformer for No. 6 Tube Stand with Clinix	450.00
Holders, Exposure for Dupli-Tized Films, see Exposure Holders.	
Illuminator, Negative (with Nitrogen Lamps and Dimmers)	60.00
Illuminator and Ruby Lamp combined, for up to 8 x 10 Plates	12.00
Indicator, X-ray Dose, Grover's	3.00
Instruments, Switchboard (set) with handle	35.00
Mouth Lamp	4.50
Antrum Lamp	4.50
Root Canal Drier	4.50
Gutta-Percha Excavator	4.50
Cautery	4.50
Canal Drier Needles, Fine	1.50
Canal Drier Needles, Medium	1.50
Canal Drier Needles, Coarse	1.50
Wax Spatula	3.25
Insulators, wall (Strain, for Trolley System), with Turnbuckle	4.50
Insulator 2 foot H. T. for Connecting Rooms	7.50

ALPHABETICAL LIST

	Intensifying Screens (Single).	
1048	5 x 7	$10.0
1049	8 x 10	20.0
1050	10 x 12	30.0
1051	11 x 14	40.0
1052	14 x 17	60.0
	Intensifying Screens (Double). Combination, for use with Dupli-Tized Films.	
2088	5 x 7 (The pair)	15.0
2089	8 x 10 " "	32.5
2090	10 x 12 " "	50.0
2091	11 x 14 " "	65.0
2092	14 x 17 " "	100.0
	(For Cassette prices, see Catalog Numbers 1053 to 1057, inclusive.)	
	Intensifying Screens (Single), with Cassettes	
1058	5 x 7	22.0
1059	8 x 10	35.0
1060	10 x 12	48.5
1061	11 x 14	62.0
1062	14 x 17	84.0
2062	Interval Timer	8.0
1060	Lead Foil. For Protection in X-ray Treatment, per lb.	.5
1061	Lead Glass. Protective, Regular Plate Sizes, per square inch	.1
1090	Lead Protective Rubber Apron	15.0
1091	Lead Protective Gloves (plain)	12.0
1092	Lead Protective Gloves (gauntlet)	15.0
1012	Lead Protective Screen, Hinged to Cabinet of SureX Transformer	90.0
1011	Lead Protective Screen, separate	90.0
1150	Manual, U. S. Army	4.0
1008	Milammeter for SureX, 8-inch diameter, 0–15—0–150M/A	60.0
1529	Milammeter with Bracket, for H. F. current	35.0
1564	Morse Sine Wave Generator	300.0
1565	Morse Moist Electrodes (set)	10.0
1123	Mortar and Pestle	1.0
1107	Mounts for Dental Films, Cardboard, double film per 100	5.5
1108	Mounts for Dental Films, Cardboard, single film per 100	4.5
1582	Nebulizer	3.0
	Negative preservers, see Plate Containers	
	Overhead Trolley System. (See Aerial System.)	
1556	Ozone Generator	20.0
1134	Pastilles, Sabouraud, 25 cents each	.2
2063	Penetrometer (Benoist)	4.0
	Photographic Supplies. (See Dark Room Supplies.)	
1587	Pilot Lamp Bulb	.5
	Plates, X-ray	
1093	5 x 7 Seed X-ray plates, with envelopes, per dozen	1.7
1094	6½ x 8½ Seed X-ray plates, with envelopes, per dozen	2.5
1095	8 x 10 Seed X-ray plates, with envelopes, per dozen	3.6
1096	10 x 12 Seed X-ray plates, with envelopes, per dozen	6.1
1097	11 x 14 Seed X-ray plates, with envelopes, per dozen	8.5
1098	14 x 17 Seed X-ray plates, with envelopes, per dozen	13.5
1099	5 x 7 Seed X-ray plates, without envelopes, per dozen	1.4
1100	6½ x 8½ Seed X-ray plates, without envelopes, per dozen	2.1
1101	8 x 10 Seed X-ray plates, without envelopes, per dozen	3.0
1102	10 x 12 Seed X-ray plates, without envelopes, per dozen	5.1
1103	11 x 14 Seed X-ray plates, without envelopes, per dozen	7.2
1104	14 x 17 Seed X-ray plates, without envelopes, per dozen	11.2
	Plate Containers. (Negative Preservers) for Filing.	
2049	5 x 7 per 100	.3
2050	6½ x 8½ per 100	.6
2051	8 x 10 per 100	.6
2052	10 x 12 per 100	1.3
2053	11 x 14 per 100	1.8
2054	14 x 17 per 100	2.2

Plate Box, lead lined	$45.00
Plate Changing Tunnel, 10 x 10	14.50
Plate Changing Tunnel, 12 x 12	19.50
Plate Changing Tunnel, 14 x 14	24.00
Plate Changing Tunnel, 17 x 17	30.00
Plate Marker	6.00
Powder Blower	3.00
Protective Screen, hinged to cabinet of SureX Transformer	90.00
Protective Screen, separate	90.00
Pump, compressed air and vacuum	150.00
Radiometer, Hampson	18.00
Reels	
6 feet Cord Reel	3.00
9 feet Cord Reel	4.00
9 feet Cord Reel, with Wheels	6.00
Coolidge Tube Reel	8.00
Coolidge Tube Reel, with Wheels	10.00
Rebuild X-ray Tube, 5", 6" or 7"	35.00
Re-exhaust X-ray Tubes, 5", 6" or 7"	10.00
Rotary Converter with step-up transformer, 6 ampere, 110 Volt D. C.	150.00
Rotary Converter without step-up transformer, 6 ampere, 110 Volt D. C.	100.00
Rotary Converter with step-up transformer, 12 ampere, 110 Volt D. C.	200.00
Rotary Converter without step-up transformer, 12 ampere, 110 Volt D. C.	150.00
Rotating Spark Gap Plate	10.00
Rubber, X-ray Protective, per sq. ft.	3.00
Rubber Apron, Lead Protective	15.00
Ruby Lamp and Illuminator, CAMPBELL combination, for up to 8 x 10 plates	12.00
Sabouraud Pastilles, each	.25
Scales (see Dark Room Supplies).	
Screens, Fluoroscopic (see Fluoroscopic screens).	
Screens, Intensifying (see Intensifying screens).	
Spark Gap Tips, for E Coil (each)	2.00
Shut-off for bottles	2.50
Sinus Head Block	6.00
Stands. (See Tube-stands.)	
Stereoscope, with Nitrogen Lamps and Dimmers	175.00
"SureX" Interrupterless Transformer	
No. 12 A. C., 220V., 60 Cycle (or 110 Volt, if ordered) Switchboard attached	1650.00
No. 12 D. C., 220V., (or 110 Volt, if ordered) Switchboard attached	1050.00
No. 2 A. C., 220 V., 60 Cycle, Switchboard attached. (Army Type)	1550.00
Separate Control Table instead Switchboard attached, difference extra	200.00
Switch, High Tension Aerial	40.00
Switchboard Instruments. (See Instruments.)	
Tables—"Clinix"—Self-Excited—Tube Tilt—Motor Driven—Auto Control.	
Clinix Tube-tilt Table without Stand, with 11 x 14 Screen, Automatic Screen Attachment, Motor Drive, Auto Control	2200.00
Clinix Tube-tilt Table, No. 6 Tube-stand, 11 x 14 Fluoroscope Screen, Automatic Screen Attachment, Motor Drive, Auto Control, complete	2500.00
Clinix Tube Tilt Table without Stand, High Tension Transformer or Control, with 11 x 14 Screen	1650.00
Clinix Tube Tilt Table without Stand, Motor, High Tension Transformer or Control, with 11 x 14 Screen	1550.00
Clinix Tube Stand Transformer, for No. 6 Tube Stand	450.00
Tanks, see Dark Room Supplies.	
Thermometer Stirring Rod	1.00
Time Controller	60.00

1010	Time Controller, with switch mounted on separate panel	$75.00
2081	Time Controller for Coolidge Bedside Unit Cabinet Type	60.00
2082	Time Controller for Coolidge Bedside Unit Portable Type	60.00
2083	Time Controller for Coolidge Dental Unit	60.00
2093	Transformer, Extra High Tension, for No. 6 Tube Stand, with Clinix	450.00
	Transformer—Coolidge, see Coolidge Transformers and Units.	
	Transformers—Interrupterless, see SureX Transformers.	
	Transformers for Clinix, see Tables Clinix	
1128	Trays, 8 x 10	1.50
1129	Trays, 10 x 12	3.00
1130	Trays, 11 x 14	4.00
1131	Trays, 14 x 17	6.00
1007	Treatment Chair (Auto-Condensation), with Leg Section (Head Section $15 extra)	85.00
	Trolley System, see Aerial System.	
1076	Trolley Wheels	3.00
1071	Trolley Reels, with Wheels, 9 feet	6.00
1070	Trolley Wire, per foot	.05
	Tubes	
1022	Tube, Coolidge, fine focus, 7"	125.00
1023	Tube, Coolidge, medium focus, 7"	125.00
1024	Tube, Coolidge, broad focus, 7"	125.00
1029	Tube, Coolidge Dental, Radiator Type	125.00
1270	Tube, Coolidge Bedside, Radiator Type (Indicate whether 10 or 30 M/A).	125.00
1027	Tube, 6" Tungsten Target (High-Frequency)	45.00
1028	Tube, 7" Heavy Tungsten Target (Transformer)	50.00
	Tube Rebuild, using old Tungsten Target 5", 6" or 7"	35.00
	Tube, Re-exhaust 5", 6" or 7"	10.00
	Tube-rack	
1084	1 Unit	3.50
1085	2 Unit	5.00
1086	4 Unit	7.50
1087	6 Unit	10.50
2011	Tube-shield, leaded rubber 5"	15.00
1523	Tube-shield, leaded rubber 6"	15.00
2010	Tube-shield, for Coolidge Dental Tube, Lead Glass	35.00
1260	Tube-shield, for Coolidge Bedside Tube, Lead Glass	25.00
	Tube-stands	
1517	Wood, portable	6.00
1516	Wood Floor Stand	15.00
2007	Coolidge Dental Tube Holder (Bracket Type) (Regular)	60.00
2106	Coolidge Tube Holder, Dental Engine Type, Long Range	110.00
2071	Coolidge Dental Tube Holder, Bracket Type (Stereoscopic)	95.00
1594	Coolidge Bedside Portable Tube Holder (Bracket Type) (Regular)	60.00
2072	Coolidge Bedside Portable Tube Holder (Bracket Type) (Stereoscopic)	95.00
1591	Coolidge Bedside, Counterweighted, Stereoscopic	190.00
1515	No. 12 Tube Stand	180.00
1013	No. 6 Stereoscopic Tube Stand with Diaphragm (Centering Rod, Catalog No. 2097, $7.50—See price list CONES).	300.00
	Units. (See Coolidge Units.)	
1579	Vacuum Cups, small	1.50
1580	Vacuum Cups, medium	1.50
1581	Vacuum Cups, large	1.50
1035	View Box (Plate Illuminator), Size 17" x 17" with Nitrogen Lamps and Dimmer	60.00
1068	Wall Board	3.00
1067	Wall Insulator (Strain) without Turnbuckle	4.00
1132	Wash Box to hold 14 x 17 Plates	12.00
1070	Wire for Trolley System, per ft.	.05
2098	X-ray Dose Indicator, Grover's	3.00

NUMERICAL PRICE LIST

September 1, 1920

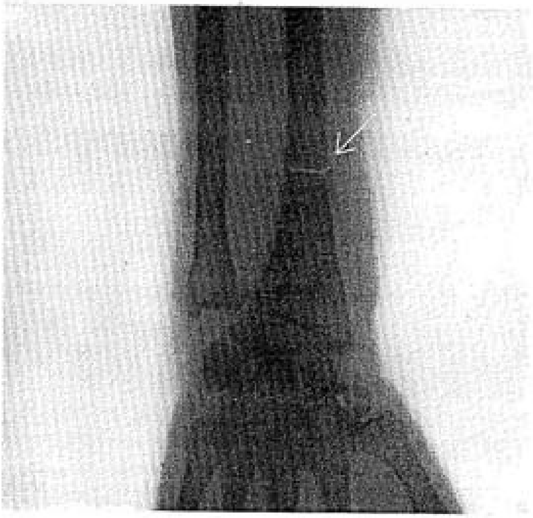
	Price
"SureX" Interrupterless Transformer	
No. 12 A. C., 220V., 60 Cycle (or 110V., if ordered) Switchboard attached	$1650.00
No. 12 D. C., 220 V., (or 110V., if ordered) Switchboard attached	1950.00
No. 2 A. C., (Army Type) Switchboard attached	1550.00
Separate Control Table for No. 12 SureX, instead of Switchboard attached, Difference Extra	200.00
Rubber, X-ray Protective, per sq. ft.	3.00
Auto Condensation Chair (with Leg Section) (Head Section $15 extra)	85.00
Milammeter for SureX, 8-inch diameter, 0-15—0-50 M/A.	60.00
Time Controller	60.00
Time Controller, with switch mounted on separate panel	75.00
Protective Screen, separate	90.00
Protective Screen, hinged to cabinet of SureX Transformer	90.00
No. 6 Stereoscopic Tube-stand, with diaphragm	300.00
(Centering Rod, Catalog No. 2007, $7.50—see price list CONES)	
Cones	
No. 6A	14.00
No. 6B	17.00
No. 6C	14.00
No. 6D	14.00
No. 5A	14.00
No. 5B	17.00
Coolidge Tubes	
Fine Focus, 7"	125.00
Medium Focus, 7"	125.00
Broad Focus, 7"	125.00
Coolidge Tube Filament Transformer, with Control, A. C. (specify voltage)	85.00
Tube, 6" Tungsten Target (High-Frequency)	45.00
Tube, 7" Heavy Tungsten Target (Transformer)	50.00
Dental Tube, Radiator Type	125.00
Stereoscope with Nitrogen Lamps and Dimmers	175.00
Illuminator, Negative (with Nitrogen Lamps and Dimmers)	60.00
Foot Switch, heavy capacity, double contact, to control lamp	45.00
Foot Switch, heavy capacity, single contact, with Cable and Plug	30.00
Fluoroscope	
8 x 10, not Folding	50.00
Fluoroscope Screens	
8 x 10	35.00
10 x 12	52.00
11 x 14	72.00
14 x 17	102.00
Fluoroscope Screen mounted in Oak Frame, with Lead Glass	
8 x 10	52.00
10 x 12	65.00
11 x 14	95.00
14 x 17	135.00
Fluoroscopy, Vertical, Horizontal, Angular (see Tables).	
Intensifying Screens (Single).	
5 x 7	10.00
8 x 10	20.00
10 x 12	30.00
11 x 14	40.00
14 x 17	60.00

NUMERICAL LIST

1053	Cassettes 5 x 7 (for Intensifying Screens)	$ 12.00
1054	Cassettes 8 x 10 (for Intensifying Screens)	15.00
1055	Cassettes 10 x 12 (for Intensifying Screens)	18.50
1056	Cassettes 11 x 14 (for Intensifying Screens)	22.00
1057	Cassettes 14 x 17 (for Intensifying Screens)	24.00
	Intensifying Screens (Single), with Cassettes	
1058	5 x 7	22.00
1059	8 x 10	35.00
1060	10 x 12	48.50
1061	11 x 14	62.00
1062	14 x 17	84.00
1063	Plate Changing Tunnels, 10 x 10	14.50
1064	Plate Changing Tunnels, 12 x 12	19.50
1065	Plate Changing Tunnels, 14 x 14	24.00
1066	Plate Changing Tunnels, 17 x 17	30.00
	Individual Parts	
1067	Wall Insulator (Strain) without Turnbuckle	4.00
1068	Wall Board	3.00
1069	Wall Insulator (Strain, for Trolley System) with Turnbuckle	4.50
1070	Trolley Wire, per foot	.05
1071	9 feet Cord Reel, with Wheels	6.00
1072	Trolley Wheel	3.00
1073	Coolidge Tube Reel, with Trolley Wheels	10.00
1074	2 foot H. T. Insulator Tubes for Connecting Rooms	7.50
1075	Aerial H. T. Switch, complete	40.00
1076	Aerial System (standard) Consisting of 2 Wall Boards, 3 Wall Insulators, with Turnbuckles, 3 Wall Insulators, without Turnbuckles, 80 feet Trolley Wire, 1 Trolley Reel, with Wheels, 1 Coolidge Tube Reel	50.00
1077	9 feet Cord Reel	4.00
1078	Coolidge Tube Reel	8.00
	Filters, aluminum	
1079	1 mm.	1.00
1080	2 mm.	1.50
1081	3 mm.	2.00
1082	Sinus Head Block	6.00
1083	Plate Box, lead lined	45.00
	Tube-rack	
1084	1 Unit	3.50
1085	2 Unit	5.00
1086	4 Unit	7.50
1087	6 Unit	10.50
1088	Plate Marker	6.00
1089	Radiometer, Hampson	18.00
1090	Apron, X-ray Protective	15.00
1091	Gloves, opaque protective (plain)	12.00
1092	Gloves, opaque protective (gauntlet)	15.00
	Plates, X-ray	
1093	5 x 7 Seed X-ray Plates, with envelopes, per dozen	1.70
1094	6½ x 8½ Seed X-ray Plates, with envelopes, per dozen	2.55
1095	8 x 10 Seed X-ray Plates, with envelopes, per dozen	3.60
1096	10 x 12 Seed X-ray Plates, with envelopes, per dozen	6.10
1097	11 x 14 Seed X-ray Plates, with envelopes, per dozen	8.50
1098	14 x 17 Seed X-ray Plates, with envelopes, per dozen	13.50
1099	5 x 7 Seed X-ray Plates, without envelopes, per dozen	1.40
1100	6½ x 8½ Seed X-ray Plates, without envelopes, per dozen	2.10
1101	8 x 10 Seed X-ray Plates, without envelopes, per dozen	3.00
1102	10 x 12 Seed X-ray Plates, without envelopes, per dozen	5.15
1103	11 x 14 Seed X-ray Plates, without envelopes, per dozen	7.25
1104	14 x 17 Seed X-ray Plates, without envelopes, per dozen	11.25
	Films, Dental	
1105	¾" x 1¼", per dozen	.50
1106	1¼" x 2¼", per dozen	.85
1107	2¼" x 3", per dozen	1.75
1108	Film Mounts, cardboard, per hundred	4.50
1109	Film Mounts, transparent, per hundred	5.50

TO SHOW THE WIDE FIELD IN WHICH BOTH THE X-RAY AND HIGH FREQUENCY CURRENTS HAVE BEEN EMPLOYED WITH SUCCESS, SEE OUR BOOKLET ENTITLED "PRACTICAL ELECTRO-THERAPEUTICS" WHICH HAS BEEN COMPILED FROM ACTUAL REPORTS OF CASES. THIS BOOKLET LISTS DISEASES ALPHABETICALLY WITH SUGGESTIONS FOR PROPER METHOD OF CURRENT APPLICATION, ALSO EXPLAINS HOW TO SECURE BEST RESULTS IN RADIOGRAPHY. FREE ON REQUEST.

RADIOGRAPH MADE WITH A CAMPBELL COIL.



Fracture of Wrist.

SPECIFICATIONS AND PRICE LIST

Model "D" Coil

This Coil will give—

X-Ray of more than twice the volume of the best static machine. Unlike the latter it is not subject to variations in atmospheric conditions and is *always ready for use* by the simple turn of key on an ordinary lamp socket.

A High Frequency current ranging from a few thousand to many million oscillations—low enough to produce powerful muscular contractions, or high enough to fuse a steel wire or light an incandescent lamp through the body without sensation.

A Thermo-Faradic current of large volume.

A Sinusoidal current of variable strength.

A D'Arsonval current of large volume and high frequency for the treatment of defective metabolism, etc., or low frequency for exciting muscular contractions.

A Cautery current sufficient for all electro-cautery work.

The cost of operation is very small not exceeding four cents per hour for X-Ray work and less than one cent per hour for exciting the vacuum electrodes.

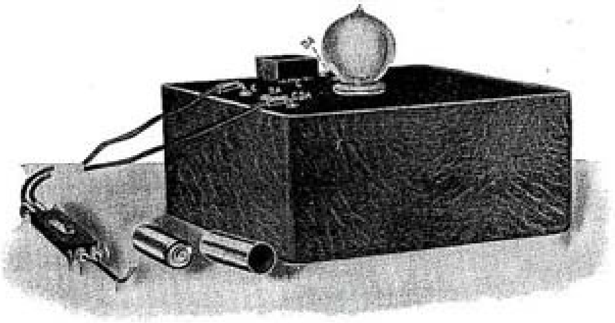
The coil is portable and is carried in a manner similar to a dress suit case. When set up ready for operation the cover, being a separate part, can be laid aside, out of the way, thus giving the apparatus the appearance of a fixture of stability rather than an outfit for temporary use. The finely finished oak case is of strong construction, with dovetailed corners. The carrying handle is of leather. All metal parts are highly finished in brass and nickel and the coil in general is (to use the words of one of our customers) "as near perfection as any one would want an X-Ray and High Frequency coil to be."

No. 2. (See cut on page 21) **PRICE $180.00**

Cabinet

To meet the demand for a more imposing piece of apparatus we have designed the Model "D" Cabinet. It is made of quartered oak, beautifully finished, and makes a very attractive piece of office furniture. Contains two drawers for holding various parts of the equipment, a storage section in which there is a rack for holding X-Ray tubes and a place for fluoroscope. There is also a plate glass paneled door through which may be seen the vacuum electrodes, fluorescent while coil is in use. The top is recessed to receive the portable coil in such a manner that when the coil and cabinet are combined they have the appearance of being inseparable. All metal parts are highly finished in polished nickel, and as all the quartered oak used in all our cabinet work is selected stock finished with a beautiful piano polish, this cabinet is a very desirable part of the equipment from an ornamental point of view as well as for its usefulness.

No. 3. (See cut on page 22) **PRICE $39.00**



Cautery and D'Arsonval Outfit

This outfit consists of an attachment, interchangeable with the case containing the High Frequency Coil andgreatly increases the range of usefulness of the apparatus. Delivers D'Arsonval current suitable for use with the various methods of application, including the auto-condensation couch. Can also be regulated to produce the Cautery current—that may be regulated at will to steadily heat cautery points to any necessary degree of intensity. There is also included with the outfit, black fibre cautery handle with switch, one cautery point, one pair conducting cords, (black silk covered); one pair metal hand electrodes and two block tin electrodes.

No. 4. For model D coil . **PRICE $21.00**
No. 5. " Standard " . . " **24.00**

Floor Tube Stand

Constructed entirely of hardwood with exception of the base which consists of three cast iron legs of artistic design, with the greatest weight at the outer extremities, thus making a stand comparatively light in weight but at the same time one that will hold securely and properly balance the large X-Ray tubes. Also allows a range of adjustment at any angle from the floor to a height of over six feet.

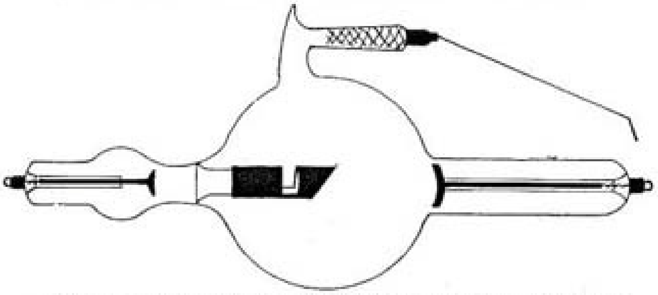
No. 7. (See cut on page 22) **PRICE $10.00**

Fluoroscope

The fluoroscope is fitted with the best quality imported platinum barium cyanide screen, size five by seven inches and gives perfect definition. The frame is light, strong and of a shape and size most convenient to handle.

No. 8. (See cut on page 22) **PRICE $12.00**

HEAVY ANODE X-RAY TUBE



Designed especially for use with the Campbell Coil. Target is very heavy and has a large heat radiating capacity. The discharge from one cathode only is utilized, the other cathode being focussed into a small hole in the rear of the target terminal. Unquestionably the best high frequency tube made.

No. 10. . . . . **Price $18.00**

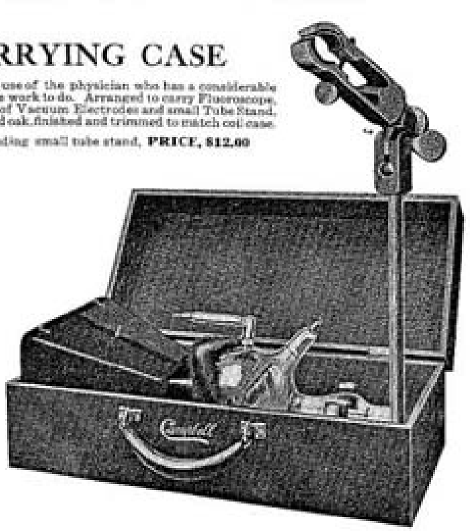
LIGHT ANODE X-RAY TUBE. For light work where it is not necessary to operate the coil full force.

No. 11. . . . . **Price $14.00**

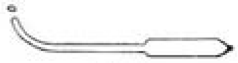
CARRYING CASE

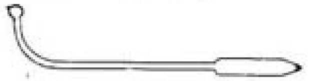
Designed for use of the physician who has a considerable amount of outside work to do. Arranged to carry Fluoroscope, X-Ray Tube, set of Vacuum Electrodes and small Tube Stand. Made of quartered oak, finished and trimmed to match coil case.

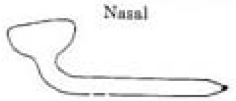
No. 12, including small tube stand, **PRICE, $12.00**

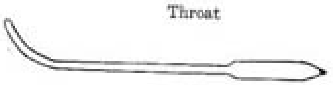


VACUUM ELECTRODES

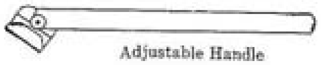

Nasal

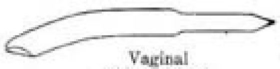

Throat

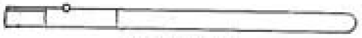

Surface


Urethral

Rectal


Adjustable Handle


Vaginal
with cupped end


Rigid Handle

Set of Electrodes furnished with outfit

The above set is all that is required for ordinary work. It has always been our aim to manufacture only the best electrodes, and in this set, as well as in our other electrodes, tough, heavy glass is used, workmanship is of the best, and the set is durable and trustworthy.

No. 9. Complete Set of Six, with Handle, $5.00

ROTARY CONVERTER

We find that when operating a high frequency coil on direct current a much smoother and better quality of current output is obtained by the use of a rotary converter of the design that we regularly furnish with our outfits. This converter can also be used as a motor. When coil is to be used on direct current add to price of outfit, for converter—

No. 14. . . . . . . Price $35.00.

SUMMARY

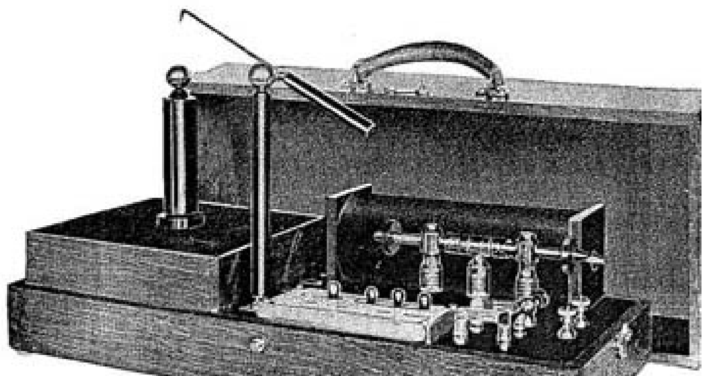
	Cata. No.	Page	Price
Campbell "Standard" Coil	1	19	$150.00
Campbell Model "D" Coil	2	15	180.00
Cabinet	3	15	39.00
Cautery and D'Arsonval Outfit (Model D)	4	16	21.00
Cautery and D'Arsonval Outfit (Standard)	5	16	24.00
Rheostat (necessary for Standard Coil only)	6	20	6.00
Floor Tube Stand	7	16	10.00
Fluoroscope	8	16	12.00
Set of Six Vacuum Electrodes and Handle	9	18	5.00
Heavy Anode X-Ray Tube	10	17	18.00
Light Anode X-Ray Tube	11	17	14.00
Carrying Case with Small Tube Stand	12	17	12.00
Rotary Converter (necessary only for direct current)	14	18	35.00

OUR PRICES are the lowest at which strictly high grade apparatus can be furnished.

OUTFIT NUMBER ONE

WILL GIVE

X-Ray — High Frequency — Cautery — D'Arsonval


CAMPBELL "STANDARD" PORTABLE COIL
Furnished With Outfit Number One

	Cata. No.	Page	Price
Standard Portable Coil, with cords and plug	1	19	$150.00
Rheostat	6	20	6.00
Cautery and D'Arsonval Outfit	5	16	24.00
Heavy Anode X-Ray Tube	10	17	18.00
Floor Tube Stand	7	16	10.00
Fluoroscope with P. B. C. Screen	8	16	12.00
Set of six Vacuum Electrodes	9	18	5.00
Outfit complete boxed ready for shipment			**$225.00**

Complete instructions for setting up and operating furnished with each outfit.

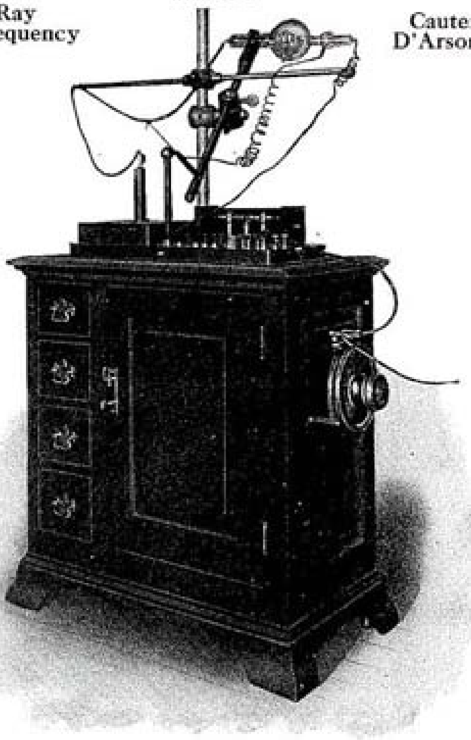
This outfit is for light X-Ray work and all the high-frequency effects except Sinusoidal and Thermo-Faradic.

OUTFIT NUMBER TWO

WILL GIVE

X-Ray
High Frequency

Cautery
D'Arsonval



CAMPBELL "STANDARD" COIL WITH CABINET
Furnished with Outfit Number Two

	Cata. No.	Page	Price
Standard Portable Coil, with cords and plug	1	19	$150.00
Standard Cabinet	3	15	39.00
Rheostat	6	20	6.00
Cautery and D'Arsonval Outfit	5	16	24.00
Heavy Anode X-Ray Tube	10	17	18.00
Floor Tube Stand	7	16	10.00
Fluoroscope with P. B. C. Screen	8	16	12.00
Set of six Vacuum Electrodes	9	18	5.00
Outfit complete boxed for shipment			**$264.00**

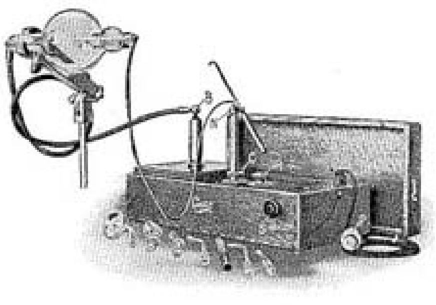
Complete instructions for setting up and operating furnished with each outfit.

Above outfit gives the same effects as outfit No. 1, but makes a more imposing appearance on account of the cabinet, and still retains the portable feature.

OUTFIT NUMBER THREE

WILL GIVE

X-Ray — High Frequency — Cautery — D'Arsonval
Sinusoidal — Thermo-Faradic



READY FOR USE

PORTABLE

CAMPBELL "MODEL D" PORTABLE COIL
Furnished With Outfit Number Three

Complete Outfit consists of

	Cata. No.	Page	Price
Model D Portable Coil, with cords and plug	2	15	$180.00
Cautery and D'Arsonval Outfit	4	16	21.00
Heavy Anode X-Ray Tube	10	17	18.00
Floor Tube Stand	7	16	10.00
Fluoroscope with P. B. C. Screen	8	16	12.00
Set of six Vacuum Electrodes	9	18	5.00
Outfit complete boxed ready for shipment			**$246.00**

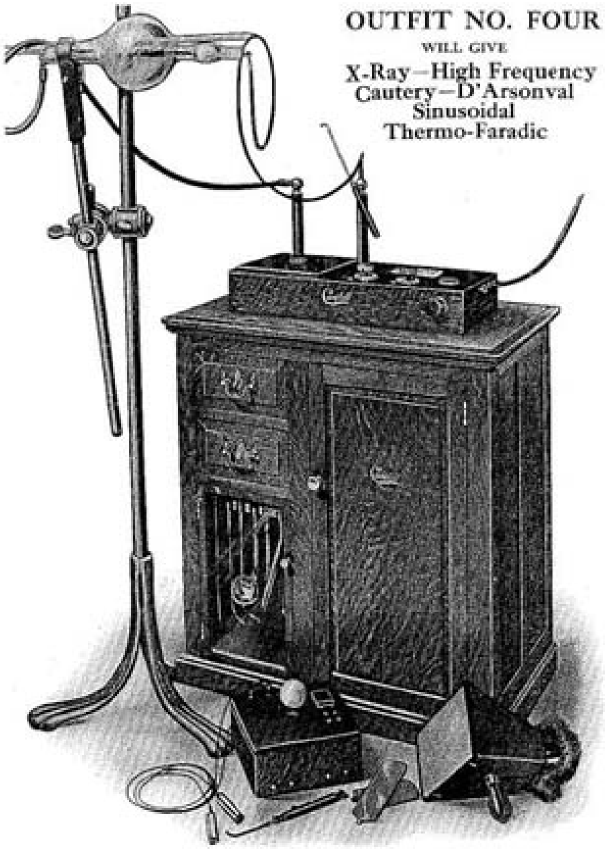
Complete instructions for setting up and operating furnished with each outfit.

With this outfit may be obtained X-Ray suitable for quick radiograph work or fluoroscopic examinations of any part of the body, as well as all the high-frequency effects which may be finely regulated for application with vacuum, metallic, cataphoresis and other electrodes, condensation couch, etc.

OUTFIT NO. FOUR

WILL GIVE

X-Ray—High Frequency
Cautery—D'Arsonval
Sinusoidal
Thermo-Faradic



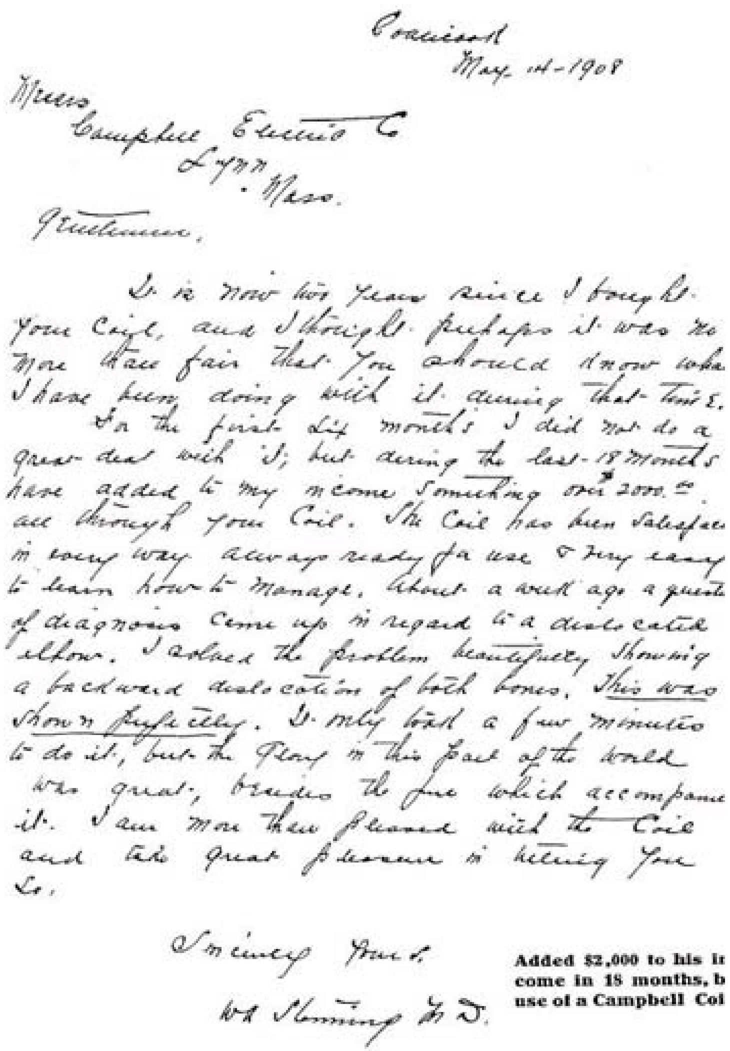
CAMPBELL MODEL "D" PORTABLE COIL WITH CABINET, ETC.

Furnished with Outfit Number Four

	Cata. No.	Page	Price
Model "D" Portable Coil, with cords and plug	2	15	$150.00
Model "D" Cabinet	3	15	29.00
Cautery and D'Arsonval Outfit	4	16	21.00
Heavy Anode X-Ray Tube	10	17	19.00
Floor Tube Stand	7	16	16.00
Fluoroscope with P. B. C. Screen	8	16	12.00
Set of six Vacuum Electrodes	9	18	5.00
Outfit complete boxed ready for shipment			**$285.00**

Complete instructions furnished with each outfit for setting up and operating.

Contains all the features found in the No. 3 Outfit with the addition of the Model "D" Cabinet which gives the outfit a most beautiful and impressive appearance, at the same time retaining the portable feature. Here is the ideal equipment. No physician's office equipment is complete without it.



Concord
May 14-1908

Messrs
Campbell Electric Co
Lynn
Mass.

Gentlemen,

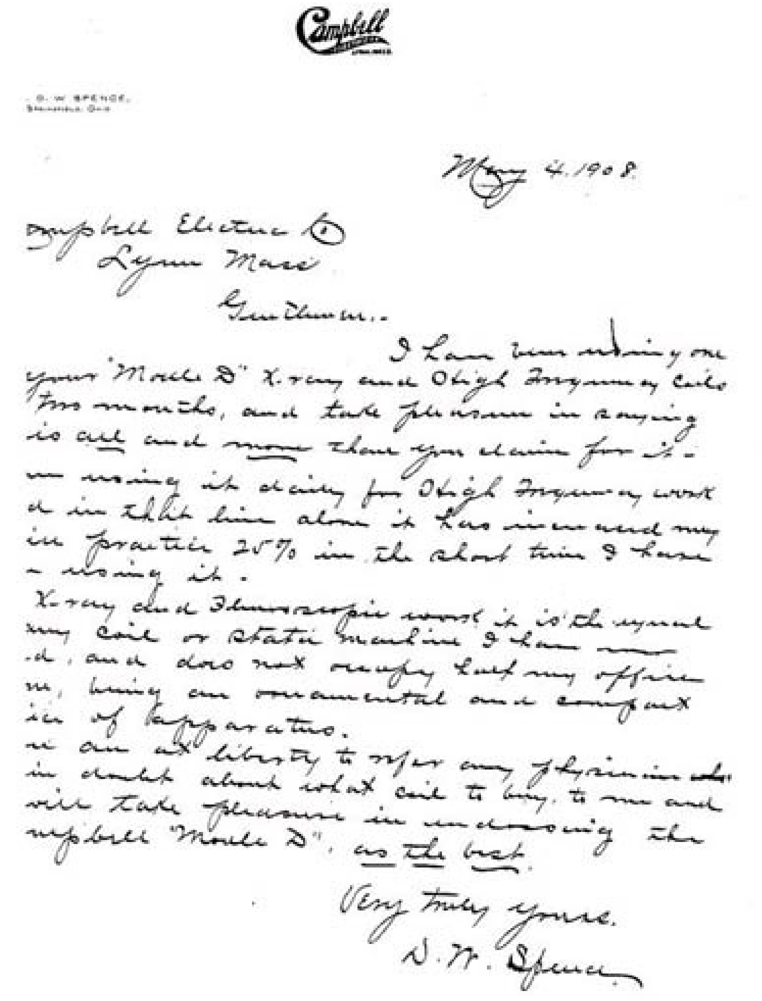
It is now two years since I bought your Coil, and I thought perhaps it was no more than fair that you should know wha I have been doing with it during that time.

For the first six months I did not do a great deal with it; but during the last 18 months have added to my income something over 2000.00 all through your Coil. The Coil has been satisfac in every way always ready for use & very easy to learn how to manage. About a week ago a questi of diagnosis came up in regard to a dislocated elbow. I solved the problem beautifully showing a backward dislocation of both bones. This was shown perfectly. It only took a few minutes to do it, but the glory in this part of the world was great, besides the fee which accompan it. I am more than pleased with the Coil and take great pleasure in telling you so.

Sincerely Yours

Wm Fleming M.D.

Added $2,000 to his i
come in 18 months, b
use of a Campbell Coi



Campbell

D. W. SPENCE,
SPRINGFIELD, OHIO

May 4. 1908.

ampbell Electric Co
Lynn Mass

Gentlemen:-

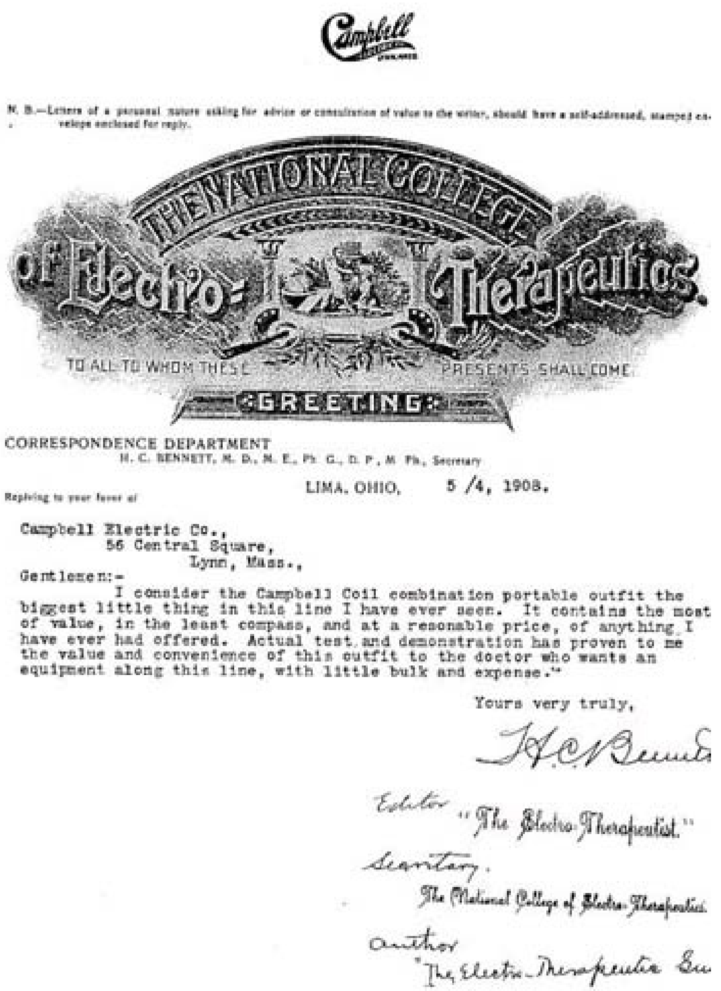
I have been using one your "Model D" X-ray and High Frequency Coils two months, and take pleasure in saying is all and more than you claim for it.- m using it daily for High Frequency work d in this line alone it has increased my ce practice 25% in the short time I have n using it.

X-ray and Fluoroscopic work it is the equal ny coil or static machine I have — d, and does not occupy half my office m, being an ornamental and compact ice of apparatus.

m am at liberty to refer any physician who in doubt about what coil to buy, to me and will take pleasure in endorsing the mpbell "Model D", as the best.

Very truly yours.
D. W. Spence

Says our coil is all and more than we claim for it and it has increased his office practice 25% in two months.



Campbell

N. B.—Letters of a personal nature asking for advice or consultation of value to the writer, should have a self-addressed, stamped envelope enclosed for reply.

THE NATIONAL COLLEGE
of Electro-Therapeutics
TO ALL TO WHOM THESE PRESENTS SHALL COME
GREETING:

CORRESPONDENCE DEPARTMENT
H. C. BENNETT, M. D., M. E., Ph. G., D. P., M. Ph., Secretary

Replying to your favor of

LIMA, OHIO, 5 /4, 1908.

Campbell Electric Co.,
56 Central Square,
Lynn, Mass.,

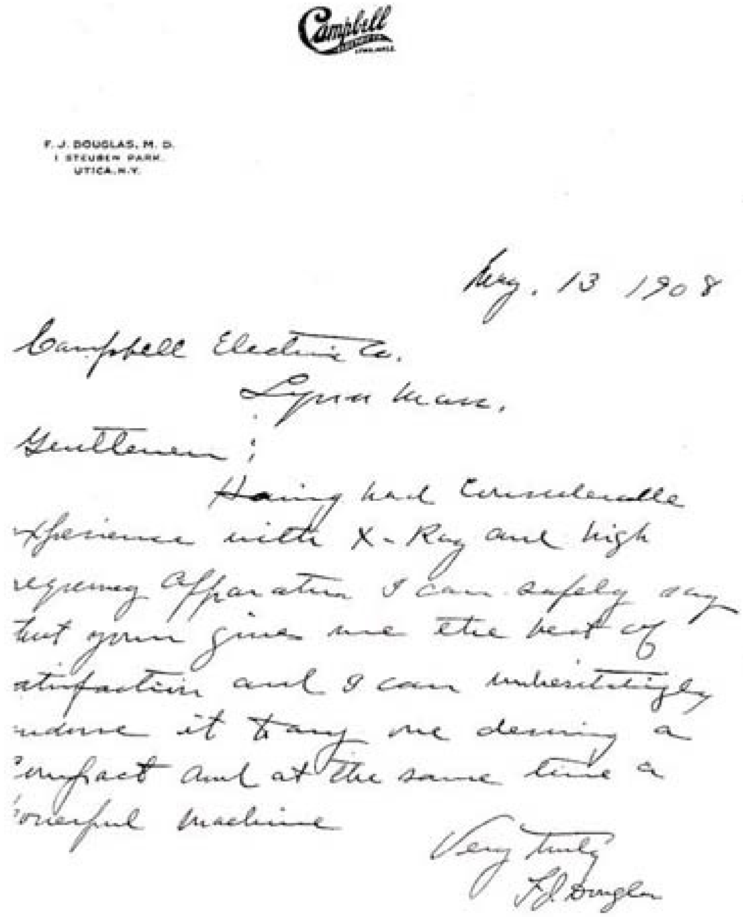
Gentlemen:-

I consider the Campbell Coil combination portable outfit the biggest little thing in this line I have ever seen. It contains the most of value, in the least compass, and at a resonable price, of anything I have ever had offered. Actual test and demonstration has proven to me the value and convenience of this outfit to the doctor who wants an equipment along this line, with little bulk and expense."

Yours very truly,
H. C. Benne

Editor "The Electro-Therapeutist."
Secretary.
The National College of Electro-Therapeutics.
author
"The Electro-Therapeutic Gu

Most value in the least compass and at a reasonable price, of anything he has ever had offered.



F. J. DOUGLAS, M. D.
1 STEUBEN PARK
UTICA, N.Y.

May. 13 1908

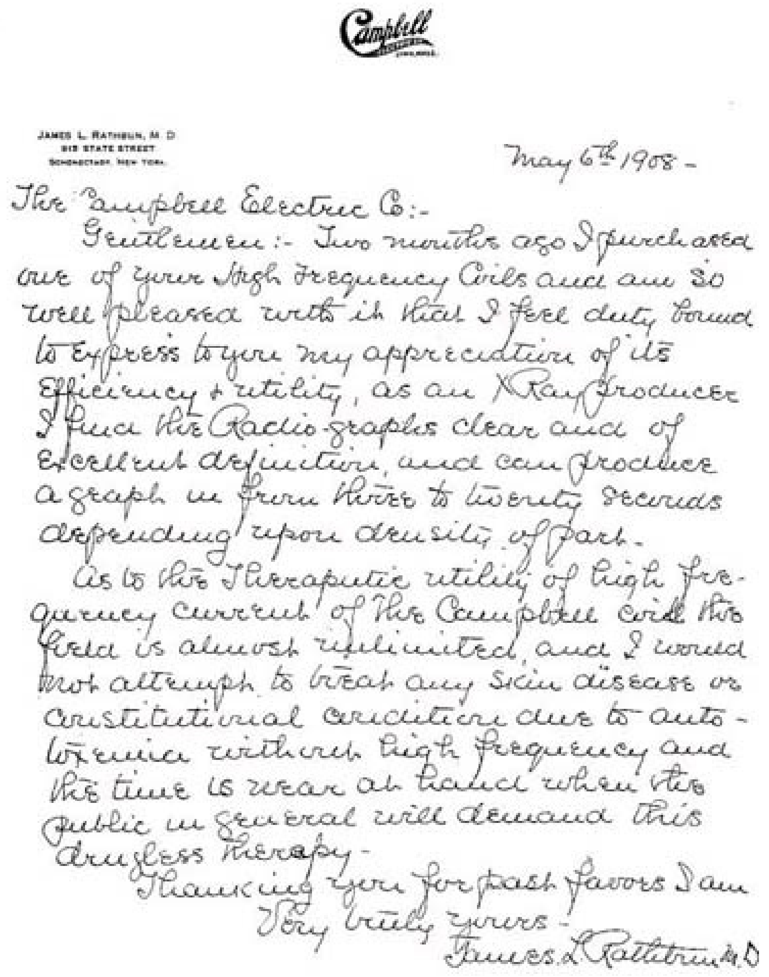
Campbell Electric Co.
Lynn Mass.

Gentlemen;

Having had considerable
xperience with X-Ray and high
requency apparatus I can safely say
hat yours gives me the best of
atisfaction and I can unhesitatingly
ndorse it to any one desiring a
ompact and at the same time a
owerful machine

Very truly
F. J. Douglas

Has had considerable experience with X-Ray and High Frequency apparatus and unhesitatingly endorses the Campbell to any one desiring a compact and powerful machine.



JAMES L. RATHBUN, M. D
819 STATE STREET
SCHENECTADY, NEW YORK

May 6th 1908-

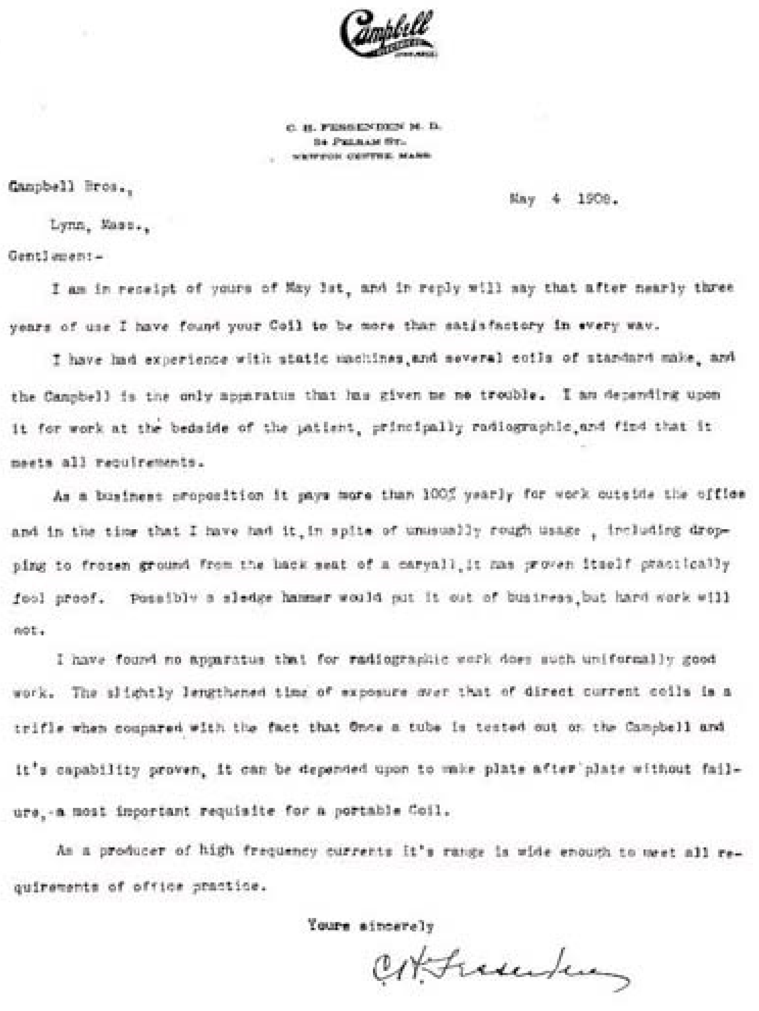
The Campbell Electric Co:-

Gentlemen:- Two months ago I purchased one of your High Frequency Coils and am so well pleased with it that I feel duty bound to Express to you my appreciation of its Efficiency & utility, as an X Ray Producer I find the Radio-graphs clear and of Excellent definition, and can produce a graph in from three to twenty seconds depending upon density of part.

As to the Therapeutic utility of high frequency current of the Campbell coil the field is almost unlimited, and I would not attempt to treat any skin disease or constitutional condition due to auto-toxemia without high frequency and the time is near at hand when the public in general will demand this drugless therapy-

Thanking you for past favors I am
Very truly yours-
James L. Rathbun M.D

Well pleased with his Campbell Coil, and believes the time near at hand when the public will demand this drugless therapy.



C. H. FESSENDEN M. D.
24 PELHAM ST.
NEWTON CENTRE, MASS.

Campbell Bros.,

May 4 1908.

Lynn, Mass.,

Gentlemen:-

I am in receipt of yours of May 1st, and in reply will say that after nearly three years of use I have found your Coil to be more than satisfactory in every way.

I have had experience with static machines, and several coils of standard make, and the Campbell is the only apparatus that has given me no trouble. I am depending upon it for work at the bedside of the patient, principally radiographic, and find that it meets all requirements.

As a business proposition it pays more than 100% yearly for work outside the office and in the time that I have had it, in spite of unusually rough usage , including dropping to frozen ground from the back seat of a caryall, it has proven itself practically fool proof. Possibly a sledge hammer would put it out of business, but hard work will not.

I have found no apparatus that for radiographic work does such uniformally good work. The slightly lengthened time of exposure over that of direct current coils is a trifle when compared with the fact that Once a tube is tested out on the Campbell and it's capability proven, it can be depended upon to make plate after plate without failure,-a most important requisite for a portable Coil.

As a producer of high frequency currents it's range is wide enough to meet all requirements of office practice.

Youre sincerely

C. H. Fessenden

In three years' use, has found our coil more than satisfactory in every way. Pays 100% yearly. Says hard work will never hurt it, and that it is "fool proof."

NUMERICAL LIST

Dark Room Supplies	
Developing Tank, stone	$ 75.00
Developing Tank, plate racks, each, 5 x 7	2.00
Developing Tank, plate racks, each, 6½ x 8½	2.00
Developing Tank, plate racks, each, 8 x 10	2.00
Developing Tank, plate racks, each, 10 x 12	2.00
Developing Tank, plate racks, each, 11 x 14	2.50
Developing Tank, plate racks, each, 14 x 17	2.50
Developer, Eastman X-ray, ½ dozen packages (each package makes 12 oz.)	.90
Fixing Powder (makes 64 oz.)	.25
Hard Rubber Fixing Box	18.50
Graduate, 8 ounces	.55
Graduate, 16 ounces	.75
Drying Rack	3.00
Mortar and Pestle	2.50
Ruby Lamp and Illuminator, CAMPBELL combination. For up to 8 x 10 Plates	12.00
Balance Scales	5.00
Thermometer Stirring Rod	1.00
Trays, 8 x 10	1.50
Trays, 10 x 12	3.00
Trays, 11 x 14	4.00
Trays, 14 x 17	6.00
Wash Box to hold 14 x 17 Plates	12.00
Sabouraud Pastilles, each	.25
Film Clamps. For developing, per dozen	2.50
Film Holders. For dental radiography, each	.75
Army (U. S.) Manual	4.00
Dental Coil (Coolidge Dental Unit), A. C., 50 to 60 Cycle, Mahogany finish	600.00
Bedside Tube-shield, Lead Glass	25.00
Coolidge Radiator Bedside Tube	125.00
Model "I", High Frequency Coil, A. C., 50 to 60 Cycle	500.00
Model "I", High Frequency Coil, with Pump, A. C., 50 to 60 Cycle	650.00
Model "E", High Frequency Coil, A. C., 50 to 60 Cycle	300.00
Model "H", High Frequency Coil, A. C., 50 to 60 Cycle	150.00
Cabinet for Model "E" Coil or Portable Coolidge Unit	30.00
No. 12 Tube-stand	180.00
Wood Floor Stand	15.00
Wood, portable	6.00
No. 12A	10.00
No. 12B	10.00
Fluoroscope	
5 x 7, Folding	35.00
Tube-shield, leaded rubber 6"	15.00
Pump, compressed air and vacuum	150.00
Auto Condensation Pad, with Cords	20.00
Milliammeter with Bracket, for H. F. current	35.00
Electrodes	
Plain Electrodes (set)	10.00
Surface Electrodes	1.50
Vaginal Electrodes	1.50
Rectal Electrodes	1.50
Urethral Electrodes	1.50
Nasal Electrodes	1.50
Throat Electrodes	1.50
Electrode Handle	2.00
Insulated and Miscellaneous Electrodes	
Insulated Vaginal	2.50
Insulated Rectal	2.00
Insulated Urethral	2.00
Insulated Nasal	2.00
Insulated Throat	2.00
Insulated Ear	2.00
Goitre Electrode	2.50
Single Eye Electrode	1.50
Double Eye Electrode	2.50
Cataphoric Electrode	5.00

NUMERICAL LIST

1548	Condenser (Localizing Surface) Electrode	$ 5.00
1549	Block Tin Electrode, 5" x 7"	1.00
2107	Block Tin Electrode, 8" x 10"	1.50
1550	Treatment Chair, Vacuum Electrode, each	1.00
1551	Treatment Chair, Hand Electrode, each	1.50
1552	Fulguration Electrode Handle, with 2 Electrodes (Extra Electrode 25 cents)	4.50
1553	Moist Electrode, large	3.50
1554	Moist Electrode, small	3.00
1555	Metal Hand Electrode (pair)	.75
1556	Ozone Generator	20.00
1560	Rotary Converter, with step-up transformer, 6 ampere	150.00
1561	Rotary Converter, without step-up transformer, 6 ampere	100.00
1562	Rotary Converter, with step-up transformer, 12 ampere	200.00
1563	Rotary Converter, without step-up transformer, 12 ampere	150.00
1564	Morse Sine Wave Generator	300.00
1565	Morse Moist Pads (set)	10.00
	Cords	
1567	Connecting Cord, with Plugs	3.00
1568	Heavy Cable, with Hook	2.00
1569	Light Cable, with Hook	1.50
1570	Cautery Cords (pair)	1.50
1571	Bifurcated Cord	1.50
1572	Treatment Chair Cord	1.50
1573	Cautery, Handle and Blade	6.50
1574	Cautery, Blade only	2.00
1575	Diagnostic Lamp in holder	2.50
1576	Diagnostic Lamp Bulb	.50
	Miscellaneous Parts	
1577	Small Spark Gap Tips for Model E Coil (each)	2.00
1578	Rotating Spark Gap Plate	10.00
1579	Vacuum Cups, small	1.50
1580	Vacuum Cups, medium	1.50
1581	Vacuum Cups, large	1.50
1582	Nebulizer	3.00
1583	Atomizer	3.50
1584	Powder Blower	3.00
1585	Shut-off for bottles	2.50
1586	Eustachian Tube inflator	.50
1587	Pilot Lamp Bulb	.50
1591	Coolidge Bedside Stereoscopic, Counterweighted, Tube-Stand	190.00
1592	Coolidge Bedside Coil, Portable Type, 0 to 30 Milliamperes, 3" to 5" Spark Gap, Rheostat Control, (Single Unit.) A. C.	540.00
1593	Coolidge Bedside Portable, Separate Auto Transformer Control, for use with No. 1592 as Double Unit	100.00
1594	Coolidge Bedside Portable Tube Holder, Adjustable Bracket Type (Regular)	60.00
2007	Coolidge Dental Tube Holder, Adjustable Bracket Type (Regular)	60.00
2010	Coolidge Dental Tube-shield, Lead Glass	35.00
2011	Tube-shield leaded rubber 5"	15.00
2012	Angle Indicator	7.00
	Electrodes (Glass vacuum).	
2015	Dental Electrodes (set with handle)	12.00
2016	Dental Surface Electrode	1.75
2017	Dental Cavity or Pulp Tester	1.75
2018	Dental Gum	1.75
2019	Dental Pyorrhea	1.75
2020	Dental Cataphoric	1.75
2021	Dental Handle, with Cord	3.50
2022	Instruments, Switchboard (set) with Handle	35.00
2023	Mouth Lamp	4.50
2024	Antrum Lamp	4.50

NUMERICAL LIST

2025	Root Canal Drier	$ 4.50
2026	Gutta-Percha Excavator	4.50
2027	Cautery	4.50
2028	Canal Drier Needles, Fine	1.50
2029	Canal Drier Needles, Medium	1.50
2030	Canal Drier Needles, Coarse	1.50
2031	Wax Spatula	3.25
2043	Film Chest, Dental Lead	12.00
2044	Film Illuminator, Dental	7.50
2045	Ammeter. For Coolidge Filament Transformer	30.00
2046	Developing Cabinet (Portable Dark Room)	45.00
2047	Developing Cabinet, with Trays, Films and Chemicals	50.00
	Plate Containers (Negative Preservers) (for filing).	
2049	5 x 7, per 100	.35
2050	6½ x 8½, per 100	.60
2051	8 x 10, per 100	.65
2052	10 x 12, per 100	1.35
2053	11 x 14, per 100	1.80
2054	14 x 17, per 100	2.25
2060	Foil, Lead, for X-ray Protection in Treatment, per lb.	.50
2061	Lead Glass Protective, Regular Plate Sizes, per sq. inch	.05
2062	Interval Timer	8.00
2063	Benoist Penetrometer	4.00
2064	Films, Eastman Dupli-Tized, Size 5" x 7" with envelopes, per dozen	1.25
2065	Films, Eastman Dupli-Tized, Size 6½" x 8½" with envelopes, per dozen	2.00
2066	Films, Eastman Dupli-Tized, Size 8" x 10" with envelopes, per dozen	2.85
2067	Films, Eastman Dupli-Tized, Size 10" x 12" with envelopes, per dozen	4.50
2068	Films, Eastman Dupli-Tized, Size 11" x 14" with envelopes, per dozen	5.55
2069	Films, Eastman Dupli-Tized, Size 14" x 17" with envelopes, per dozen	8.75
2071	Coolidge Dental Tube Holder, Bracket Type, (Stereoscopic)	95.00
2072	Coolidge Bedside Tube Holder, Bracket Type, (Stereoscopic)	95.00
2081	Automatic Time Controller for Coolidge Bedside Unit (Cabinet Type)	60.00
2082	Automatic Time Controller for Coolidge Bedside (Portable Type)	60.00
2083	Automatic Time Controller for Coolidge Dental Unit	60.00
2084	Campbell Coolidge Clinical Unit Coil, Metal Cabinet, 3, 4 and 5" gap, 0 to 30 m/a, A. C.	680.00
2085	Developing frame for Eastman Dupli-Tized Films	1.50
2086	Clinix—Self-Excited—Tube-Tilt Table, Motor Driven, with Screen, no Stand	2200.00
2087	Clinix—Self-Excited—Tube-Tilt Table, Motor Driven, with Screen and No. 6 Stand	2500.00
2088	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 5 x 7	15.00
2089	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 8 x 10	32.50
2090	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 10 x 12	50.00
2091	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 11 x 14	65.00
2092	Intensifying Screen (Double), Combination for use with Dupli-Tized Films, 14 x 17	100.00
	(For Cassette prices, see Catalog Numbers 1053 to 1057, inclusive.)	
2093	Extra High Tension Transformer, for No. 6 Stand, Sold only for Clinix	450.00
2094	Clinix Table without Stand, Transformer or Control, with Screen and Motor	1650.00
2095	Clinix Table without Stand, Motor, Transformer or Control, with Screen	1550.00
2096	Blackman Hand Electrode	5.00
2097	Centering Rod for No. 6 Tube Stand	7.50
2098	Grover's X-ray Dose Indicator	3.00
2099	Dental Coil, A. C., 50 to 60 Cy., Metal Cabinet, Mahogany Finish	600.00
2100	Exposure Holders for Dupli-Tized Film 5 x 7, ea.	.15
2101	Exposure Holders for Dupli-Tized Film 6½ x 8½	.15
2102	Exposure Holders for Dupli-Tized Film 8 x 10	.20
2103	Exposure Holders for Dupli-Tized Film 10 x 12	.25
2104	Exposure Holders for Dupli-Tized Film 11 x 14	.25
2105	Exposure Holders for Dupli-Tized Film 14 x 17	.35
2106	Dental Tube Holder, Engine Type, Long range, Automatic	110.00
2107	Block Tin Electrode, 8" x 10"	1.50
2108		
2109		
2110		

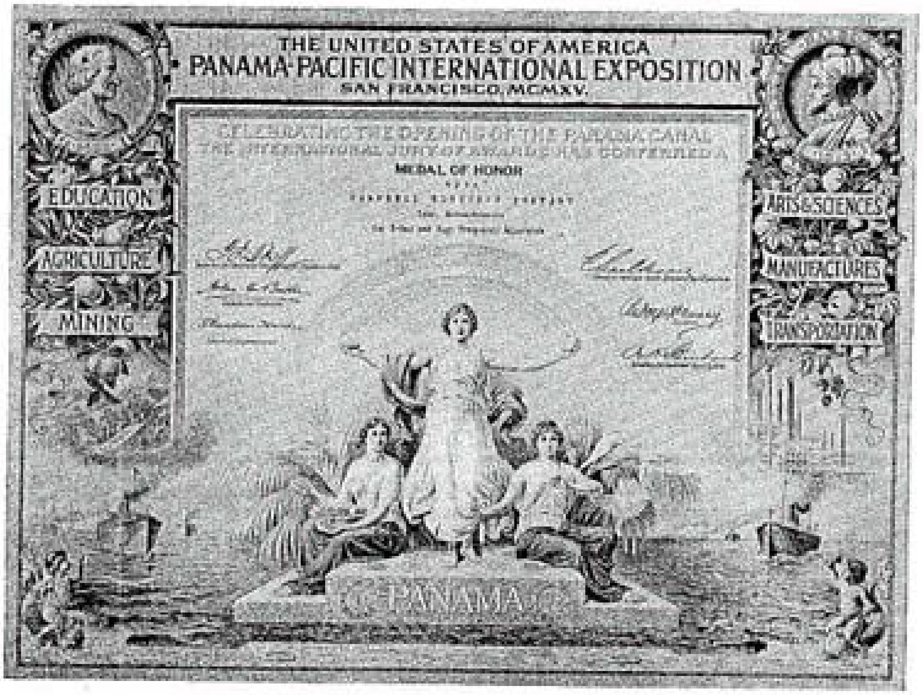
NUMERICAL LIST

2111	
2112	
2113	
2114	
2115	
2116	
2117	
2118	
2119	
2120	

Campbell
ELECTRIC CO.
LYNN, MASS.

X-RAY APPARATUS

Medal of Honor



THE UNITED STATES OF AMERICA
PANAMA-PACIFIC INTERNATIONAL EXPOSITION
SAN FRANCISCO, MCMXV.

CELEBRATING THE OPENING OF THE PANAMA CANAL
THE INTERNATIONAL JURY OF AWARDS HAS CONFERRED A
MEDAL OF HONOR

EDUCATION
AGRICULTURE
MINING
ARTS & SCIENCES
MANUFACTURES
TRANSPORTATION
PANAMA

THE HIGHEST AWARD

PANAMA-PACIFIC INTERNATIONAL EXPOSITION

SAN FRANCISCO, CALIFORNIA, 1915

PANAMA-PACIFIC INTERNATIONAL EXPOSITION
1915
ADMINISTRATION BUILDING

INTERNATIONAL AWARD SYSTEM

SAN FRANCISCO,
CALIFORNIA.

December 27th, 1915.

Campbell Electric Company,
Lynn, Massachusetts.

Attention: Mr. Fred R. Campbell.

Gentlemen:

Replying to your favor of December 21st, I beg to advise you that the medals and diplomas for exhibits in the Department of Liberal Arts, in which you are classified, will hardly be ready for distribution before March 1st. As soon as prepared they will be sent directly to you.

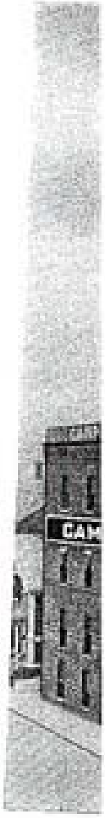
It is impossible at this time to supply you with a list of other awards made for X-ray and High-Frequency apparatus, but I desire to repeat my former statement, that the award of Medal of Honor made to you is the highest award made in this line.

In conclusion, permit me to thank you for your expressions of satisfaction as to the management of the Exposition and good wishes for its various officials, and to say that I shall be pleased to call the attention of President Charles C. Moore to the sentiments contained in your letter.

Very truly yours,

O. H. Fernbach

Secretary of the International Award System.



ION

N FRANCISCO,
CALIFORNIA.

th, 1915.

t, I beg
r exhibits
ou are
tion
will be

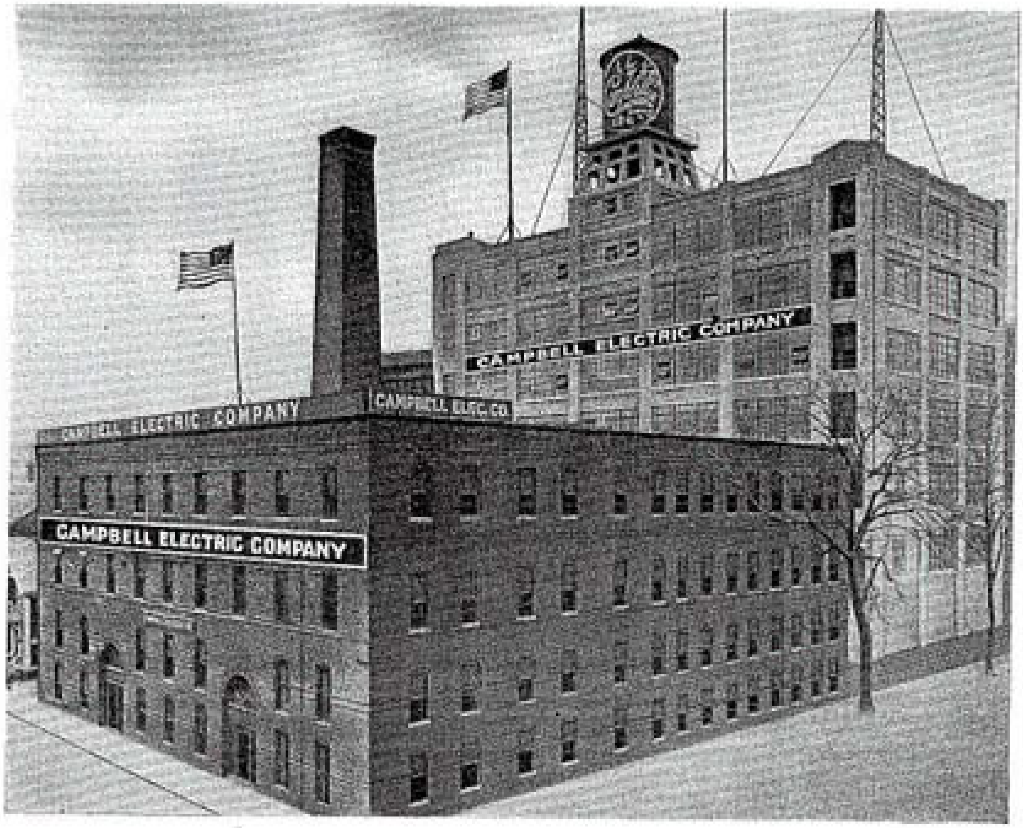
y you with
-Frequency
statement,
is the

for your
ment of the
fficials,
e attention
ts

nbach

nternational
em.

Campbell


CAMPBELL ELECTRIC COMPANY
CAMPBELL ELECTRIC COMPANY
CAMPBELL ELEC. CO.
CAMPBELL ELECTRIC COMPANY

Campbell Electric Company Factory
Lynn, Mass.

The Campbell Electric Company Factory at Lynn, Massachusetts, is conceded to be the largest plant in the world devoted to the manufacture of X-ray and High Frequency apparatus.

It is designed and constructed with especial reference to efficiency in the manufacture of X-ray and other electrical apparatus, and is as permanent and well-known in the city as its products are permanent and well known throughout the world.

s conceded to be
juency apparatus.

e manufacture of
in the city as its

Campbell Credentials

A FEW OF THEM WILL BE FOUND ON
THE PAGES IMMEDIATELY FOLLOWING.

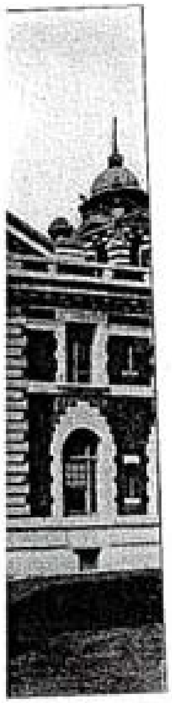
Copyright, Underwood & Underwood, New York, N. Y.

U. S. Army Debarkation Hospital, Ellis Island, New York

Equipped with Campbell Surex Transformer

Th
nations.
Conferei
an awar
Compan
English-

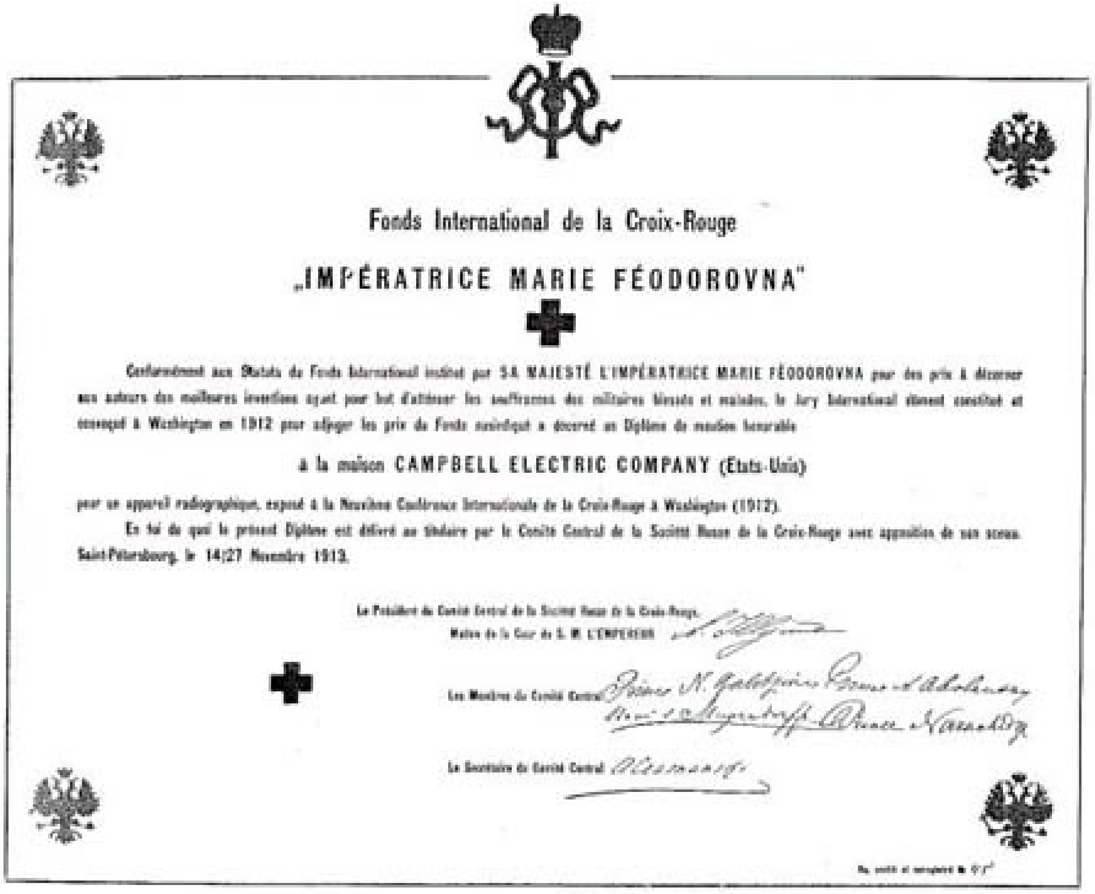
"The
Wreden, o
manent re
of Austria;



York

Campbell

The International Red Cross Conference is held only once in five years, and in different nations. In May, 1912, the Conference was held in America, at Washington, D. C. At this Conference the most prominent makes of X-ray apparatus of various nations competed for an award. The only manufacturers of America to receive an award was the Campbell Electric Company, of Lynn, Mass. The jury making the awards was a most impartial one, not an English-speaking nation being represented thereon.



Fonds International de la Croix-Rouge

„IMPÉRATRICE MARIE FÉODOROVNA"

Conformément aux Statuts du Fonds International institué par SA MAJESTÉ L'IMPÉRATRICE MARIE FÉODOROVNA pour des prix à décerner aux auteurs des meilleures inventions ayant pour but d'atténuer les souffrances des militaires blessés et malades, le Jury International dûment constitué et convoqué à Washington en 1912 pour adjuger les prix du Fonds susindiqué a décerné un Diplôme de mention honorable

à la maison **CAMPBELL ELECTRIC COMPANY** (Etats-Unis)

pour un appareil radiographique, exposé à la Neuvième Conférence Internationale de la Croix-Rouge à Washington (1912).

En foi de quoi le présent Diplôme est délivré au titulaire par le Comité Central de la Société Russe de la Croix-Rouge avec apposition de son sceau.

Saint-Pétersbourg, le 14/27 Novembre 1913.

Le Président du Comité Central de la Société Russe de la Croix-Rouge,
Maître de la Cour de S. M. L'EMPEREUR

Les Membres du Comité Central Prince N. Galitzine

Le Secrétaire du Comité Central

Vu, inscrit et enregistré № 97

From the Washington Post, Friday, May 17, 1912

"The awards announced yesterday were determined upon by a jury composed of Professor Wreden, of Russia, permanent chairman; Dr. Ferriere, of the international committee, permanent reporter; Mr. Mosle, of Germany; Lieutenant Colonel Brezzi, of Italy; Dr. Silbermark, of Austria; Senor Riano, of Spain; Dr. Dedet, of France, and Dr. Yenji Inoue of Japan."

At the outbreak of the Mexican trouble, the U. S. Army Base Hospitals along the Mexican border were equipped with Campbell "Sure X" X-ray Transformers.

When Pershing's American Expeditionary Force sailed for France, it was equipped with Campbell "Sure X" X-ray Transformers which the United States Government purchased on the strength of the highly efficient service performed by this apparatus on the Mexican border.

The U. S. Ship "George Washington," the famous Army Transport which carried President Wilson to France, is equipped with a Campbell "Sure X" Transformer.

Many U. S. Naval Hospitals and Transports throughout the world are equipped with Campbell "Sure X" Transformers.

The U. S. Hospital Ship "Solace" is equipped with a Campbell "Sure X" Transformer.

Nearly two hundred Campbell "Sure X" Transformers are in use in U. S. Government Hospitals in the United States and Europe.

The American Red Cross use Campbell "Sure X" Transformers, and selected them for use in the emergency occasioned by the great Halifax disaster.

The Campbell Clinix X-Ray Plant was selected by the U. S. Public Health Service for use in St. Elizabeth's Hospital, of about 3,800 beds, Washington, D. C., after careful comparison with all other types of X-ray apparatus and displaced separate piece equipment.

The Clinix is now being installed by America's most noted Roentgenologists as the last word in radiographic and fluoroscopic apparatus.

ıy Base
ımpbell

led for
formers
ngth of
ıe Mex-

· Trans-
with a

out the

ampbell

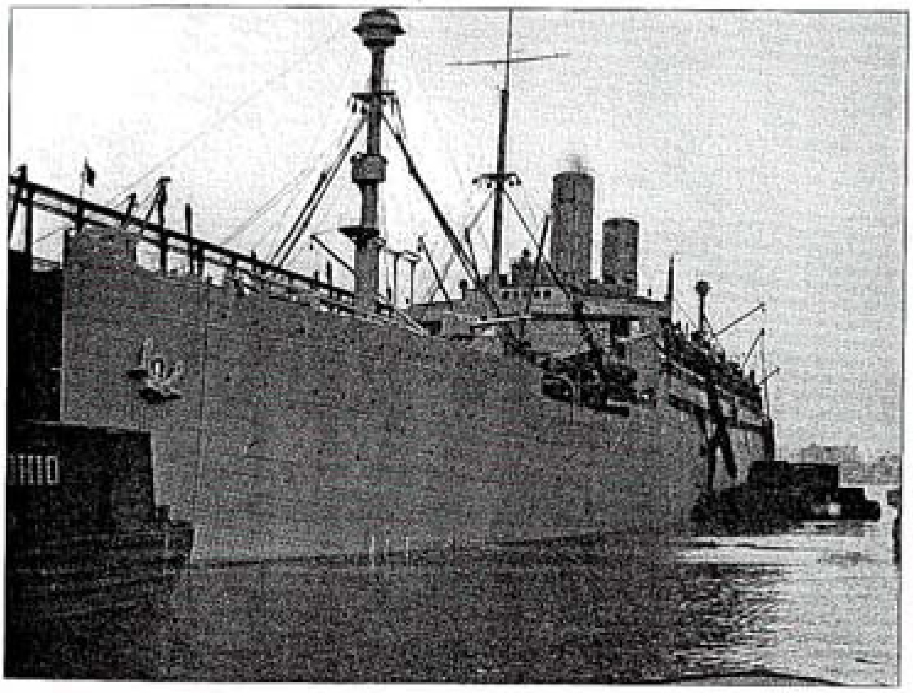
re in use
ɔpe.

formers,
he great

he U. S.
of about
all other
ɔment.

d Roent-
ɔparatus.

Campbell



Copyright, Underwood & Underwood, New York, N. Y.

U. S. S. "George Washington." The President's Peace Ship

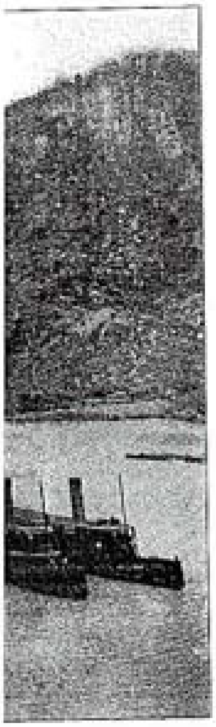
Equipped with a Campbell SureX Transformer

Copyright, Underwood & Underwood, New York, N. Y.

U. S. S. "Kroonland," passing through Culebra Cut, Panama Canal. Equipped with a Campbell Coolidge Bedside Unit

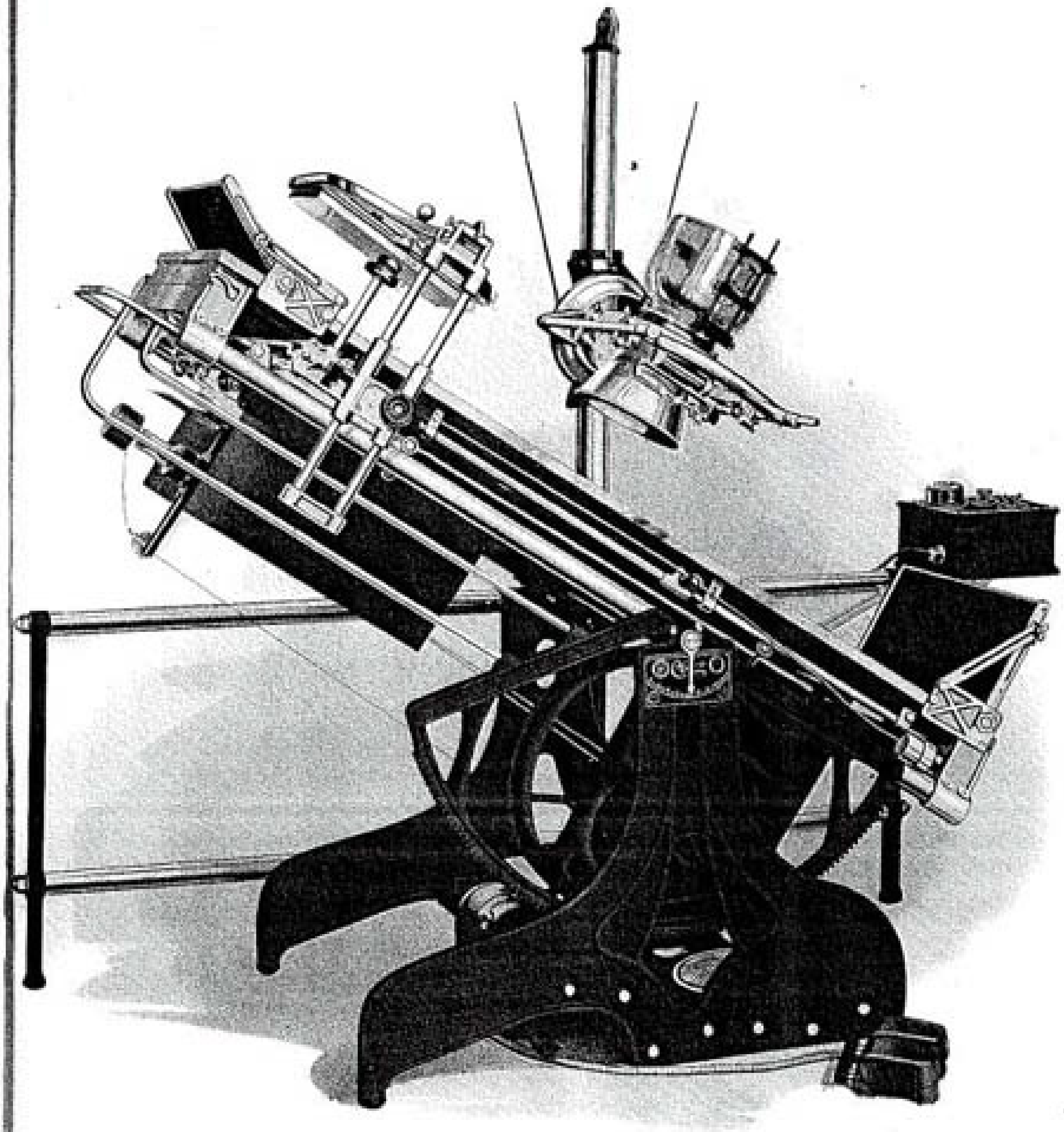
Tub

Both H



Panama Canal.
e Unit

Clinix



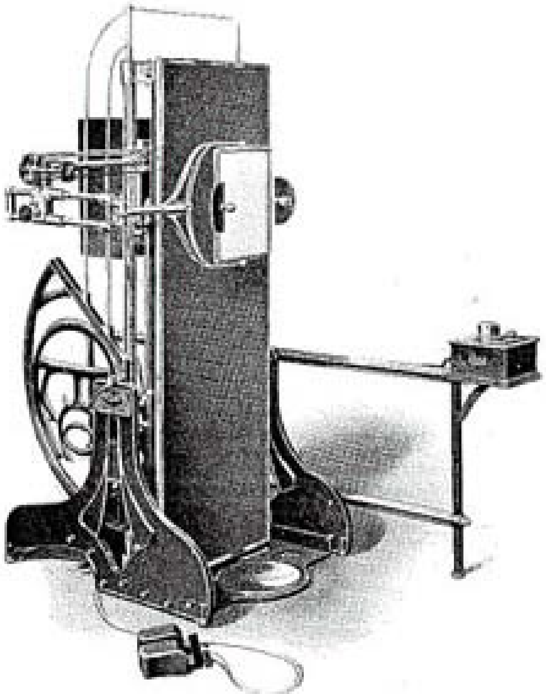
Campbell "Clinix" X-ray Plant

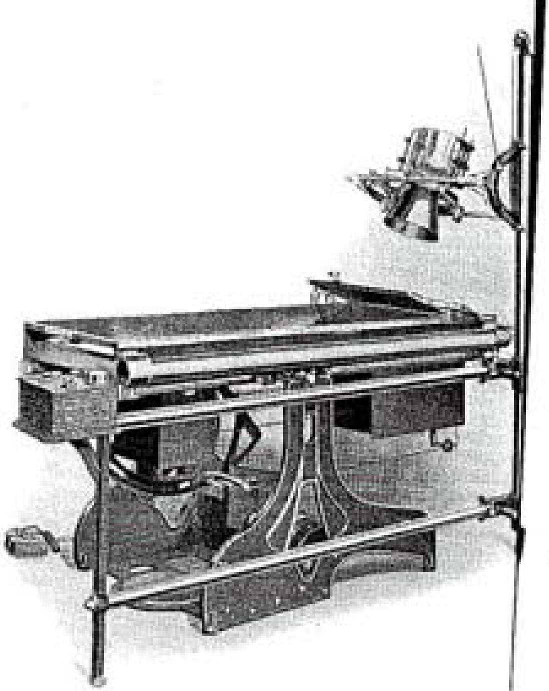
Tube Tilt Table. Motor Driven. Transformer attached to under side of table.
Also furnished with Transformer mounted on top of Tube Stand.
Both High Tension Transformers operated by the one Auto Transformer Control Case.
1 to 30 Milliamperes, 2 to 5-inch Spark Gap.

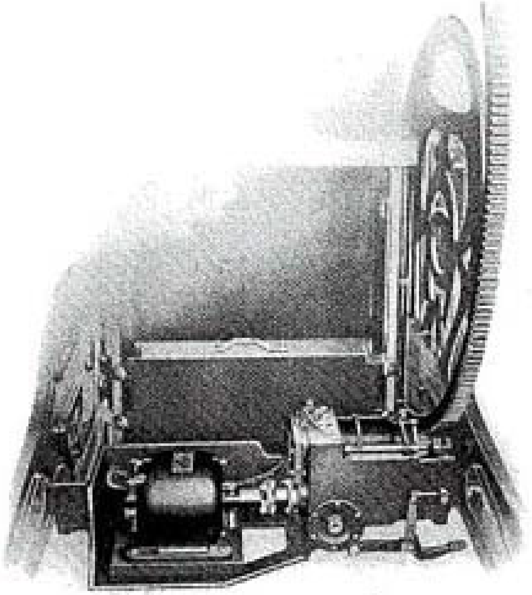
U. S. Patents
December 19, 1911; April 22, 1913; February 29, 1916;
August 7, 1917. Foreign Patents.
Other Patents Pending.

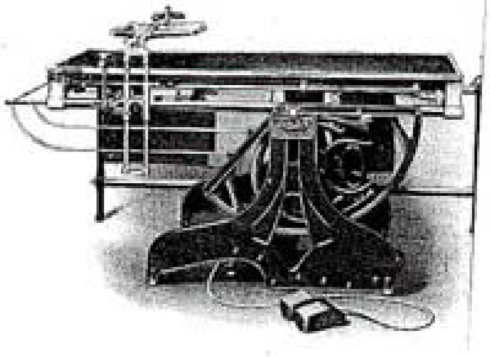
Cat. No. 2087

Clinix


CLINIX IN VERTICAL POSITION


CLINIX IN HORIZONTAL POSITION
Rear view showing Transformer and Connections


CLINIX MOTOR DRIVE AND TRANSMISSION


CLINIX IN HORIZONTAL POSITION
Operating Side

Re

Fo
Cu

Fir

Tul

Extr

Tube
Pate

Camp

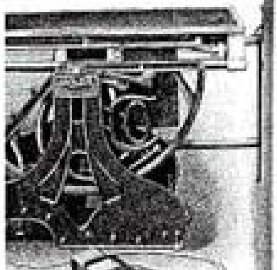
Compl
NOTE:

If suppl

Cat. No.
Cat. No.
Cat. No.

Cat. No.

RIZONTAL POSITION
ransformer and Connections



HORIZONTAL POSITION
)perating Side

TRANSFORMER
TYPE
TUBE
TILT
TABLE

Clinix X-Ray Plant

Vertical - Horizontal - Angular - Stereo Radiography Fluoroscopy and Orthodiagraphy—Motor Driven Self-Excited—1 to 30 Milliamperes—2 to 5-Inch Gap

The Clinix unit is the latest development of the Tube Tilt Table Both are original inventions of Mr. Charles E. Campbell. They have been pronounced by leading Roentgenologists as the greatest attainment in the development of X-ray apparatus and are rapidly revolutionizing X-ray technique.

The Clinix is an X-ray plant, all but the illuminators and dark room. It is a Self Excited, Motor Driven, Stereo Tube Tilt Table with a Combination Screen and Cassette Holder by which radiography as well as fluoroscopy can be done with the tube under the table. The transformer and controls are attached to and form part of the table, thus eliminating the unsightly, annoying and dangerous overhead trolley lines and high tension switch.

The patient when once placed on the Clinix remains there until a complete X-ray examination has been made in the Horizontal, Angular, Trendelenburg and Vertical positions, including fluoroscopy, radiography and orthodiagraphy.

The motor drive is of indescribable value in fluoroscopic examination of the gastrointestinal tract, in accordance with the latest technique for diagnosis of adhesions, the patient being slowly tipped from the vertical to the horizontal and Trendelenburg positions while the operator has his hands free and both the operator and patient are relieved of violent physical exertion.

The transformer attached underneath eliminates the overhead trolley and makes head of the Clinix table accessible.

The Clinix combines in one compact, convenient piece of apparatus of handsome design all the advantages of more than a score of separate pieces of cumbersome and expensive apparatus.

To relocate or rearrange the apparatus of the X-ray laboratory, just move the Clinix, that's all.

The saving in plates and films alone, by accurate localization with floroscopiç screen before making radiograph, thus allowing use of the smallest plates or films, would pay a fair return on the investment in entire outfit.

In connection with Eastman Dupli-Tized films and double intensifying screen will do all kinds of radiography.

SPECIFICATIONS.

Dimensions (overall). Length 6' 8"—Width 32" (add 3" for stand track), Height 36" to table top.

Construction. Entirely of metal except where electrical insulation is needed; a wood top, head and foot boards.

Top. Wood veneer, of careful selection, highest grade and finish. Tested by X-ray to insure a clear examination field. Opens on piano hinge for accessibility of under mechanism.

Examination Field. Extraordinarily large. Size, length 44 inches, width 22 inches. Enough for examination of head to pelvis and shoulder to shoulder without moving patient.

Tube Carriage. Arranged for Coolidge Radiator Bedside Tube (10 or 30 Milliampere) and black Lead Glass Protective Shield enclosed in Bakelite insulation. Mounted on ball bearings. Counterweight runs on ball bearings inside steel tubing on rear side of table. This construction, together with elimination of the heretofore necessary heavy sheet lead covered tube box, makes a wonderfully light weight and wide range tube carriage which moves at the slightest touch.

Stereo Shift. Locks are provided for stereo shift of tube carriage in both directions so that stereo radiographs may be made with the table tube.

Diaphragms. Lead covered, opening enough to cover a 14" x 17" screen or plate at a target distance of 21½ inches, adjustable independently or together to horizontal, vertical or square opening.

Filter. Groove under diaphragm opening for insertion of aluminum or other filtering material.

Automatic Plate Changer. :For stereo-radiographs with tube above or in front of table. Accommodates up to 14" x 17" plates in either direction. Operates with table in ıy Plant

ıy

ıp

oth are original
ıg Roentgenolo-
rapidly revolu-

s a Self Excited,
ette Holder by
the table. The
ıinating the un-
:h.

omplete X-ray
ertical positions,

ion of the gas-
ions, the patient
itions while the
violent physical

ey and makes

ıs of handsome
e and expensive

nove the Clinix,

roscopic screen
ould pay a fair

ing screen will

Height 36" to

ed; a wood top,

-ray to insure a
ıder mechanism.
inches. Enough
moving patient.
Milliampere) and
ı. Mounted on
ing on rear side
tofore necessary
t and wide range

rections so that

plate at a target
rizontal, vertical

ltering material.
ı front of table.
es with table in

---

either horizontal or vertical positions. Provided with air valve speed adjustment which requires no special adjustment for changing from horizontal to vertical shift. Quickly removable from end of table. A lead field cover is provided for insertion at upper end of table when this plate changer is used and can be put in place while patient is on table. Lower end of table is protected by a permanent sheet lead field cover attached to the iron frame.

Fluoroscopic Screen and Cassette Holder. A combination holder of aluminum with a fluoroscopic screen size 11" x 14" protected by lead glass, on the other side of which a Cassette size 11" x 14" may be quickly attached. Swivels so that plate or film may be protected from X-ray by the lead glass. Holder can be quickly changed so that the fourteen-inch dimension of screen or plate may be used laterally or longitudinally. Adjustable to any distance between 15 inches and 31 inches from target of tube to screen or plate. May be locked to maintain position irrespective of angle of table. Detachable, or may be swung and locked away from table top. Has universal movement so that screen may be tilted at any angle desired, with adjustable friction to maintain position.

Cassettes. Two 17" x 17" aluminum cassettes graduated to adapt to smaller plates. Inserted from side of table while in horizontal, angular or vertical position.

Head and Foot Boards. A head board and foot board are both provided as regular equipment, exactly alike in construction and interchangeable. Adjustable as to distance from head or foot of table. Also adjustable as to angle with relation to surface of table so that either may be used as a seat, stand, shoulder or head rest. May be tilted as a sinus block or at other angles for support of various parts of the body. Quickly adjusted and strong enough to support entire weight of a heavy patient.

Turn Table. Built as a part of the frame, operates on steel ball bearings and so constructed that patient may be easily rotated during fluoroscopic examination in the vertical position.

Graduations. No piece of X-ray apparatus was ever more thoroughly worked out and perfected in the details for convenience of the operator than the Clinix, as is evidenced in part by the graduations of each and every part where desirable to know angle or distance as follows:—Angle of table by degrees from Trendelenburg to vertical,—distance of target to screen in inches,—longitudinal travel of tube in inches,—lateral travel of tube in inches,—opening of diaphragms to cover plates or films of different sizes at various distances.

Luminous Indicators. To facilitate operation in the dark the handles which control movement of screen, diaphragms, and filament regulator are provided with luminous dials. The first five milliampere indications of milliammeters are also luminous.

Motor Drive. Reversible motor of the repulsion type in connection with a transmission, similar to that used in an automobile, geared to a large segment gear. Operates table with patient, up or down by pressure on foot switch. Limit switches stop the motor automatically at the extreme Trendelenburg and vertical positions. A pedal for foot release of motor transmission enables manual adjustment of angle of table if quicker adjustment is needed than motor provides (maximum travel is accomplished by motor in 70 seconds). Automatically locks when pedal is released.

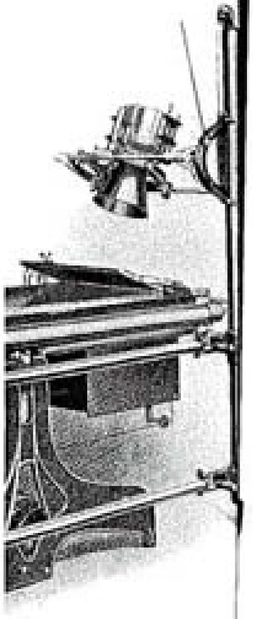
Counter Balance. Table top is so well balanced by distribution of the weight of transformer and by travelling counterweight that it may be tilted by one finger.

Guard Rail. Operating side and head of table are provided with a guard rail to prevent accidental contact with tube connections. Rear side of table is protected by tracks for tube stand and lower end by distance and the fact that secondary terminals are mounted on side of transformer facing toward head of table.

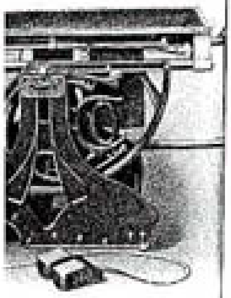
Transformer (High Tension). Secondary 65,000 volts. Closed core, non-fluid insulation, hardwood locked corner case. Sufficient capacity to deliver 1 to 30 milliamperes to X-ray tube with 2" to 5" spark gap.

Transformer (Filament). In same case with high tension transformer.

Controls. Control Case attached to end of table, provided with—auto transformer, voltmeter, milliammeter, auto transformer switch (adjusts line voltage to that for which apparatus is made) main switch, double throw tube switch and potential compensator switch (provides 3 different current changes and simultaneously maintains voltage or penetrative value of the X-ray). The high tension transformer attached to table is provided with a milliammeter and a filament regulator conveniently visible and operable from front of table independent of auto-transformer control case.



:ONTAL POSITION
sformer and Connections



IZONTAL POSITION
ating Side

Main switch is operated by a pull cord extending entire length of table so that current may be turned on or off at any position, during examination.

Reels. Self-winding. Connect from transformer secondary terminals direct to X-ray tube. Take the place of overhead trolley lines with their attendant inconvenience and danger.

Foot Switches. Positive, quick-action, prevents arcing and burning of contacts.

Current Required. Operates on alternating current of 100 to 120 volts, 50 to 60 cycle, 6 to 35 amperes, according to current used in tube. Also on direct current by addition of a rotary converter and transformer which may be installed in another room. To operate tube with ten milliamperes requires a one kilowatt rotary converter. Thirty milliamperes requires a four kilowatt converter.

Finish. The finish of frame and top is mahogany. Other parts, polished aluminum and nickel plate.

Tube Stand No. 6. For radiography and therapy with tube above table. (**When using tube in stand a separate high tension transformer must be used.**) The No. 6 Tube Stand possesses the following exclusive features in addition to all the usual advantages. Entirely controlled from operating side of table by a single lock without reaching over. Overhang 26 inches, allows radiography of either shoulder without moving patient. Friction disc holds tube safely at any angle. Stereo shift and tilt at any point of the circumference. Slight underhang. Automatic safety lock in case cable breaks. High grade ball bearings throughout. The best of machine work. Furnished with lead glass tube shield and diaphragm, complete, ready to attach to tracks of **Clinix** table.

Extra High Tension Transformer for Tube Stand, 1 to 30 milliamperes, 3" to 5" gap, with attachments for fastening to No. 6 Tube Stand, to operate tube in stand. Travels with stand. Equipped with high-tension terminals, cord reels, filament regulator and connections to Control Case. Operated by same control which operates the table tube. Double throw switch on Control Case makes it impossible to accidentally turn current on both tubes at same time. (Sold only for use with "Clinix" Table.)

Tube. Self-rectifying, Coolidge Radiator Bedside Type, ten or thirty milliampere.

Patents. This apparatus is protected by United States patents, issued Dec. 19, 1911, April 22, 1912, Feb. 29, 1916 and Aug. 7, 1917. Also by foreign patents. Other patents pending.

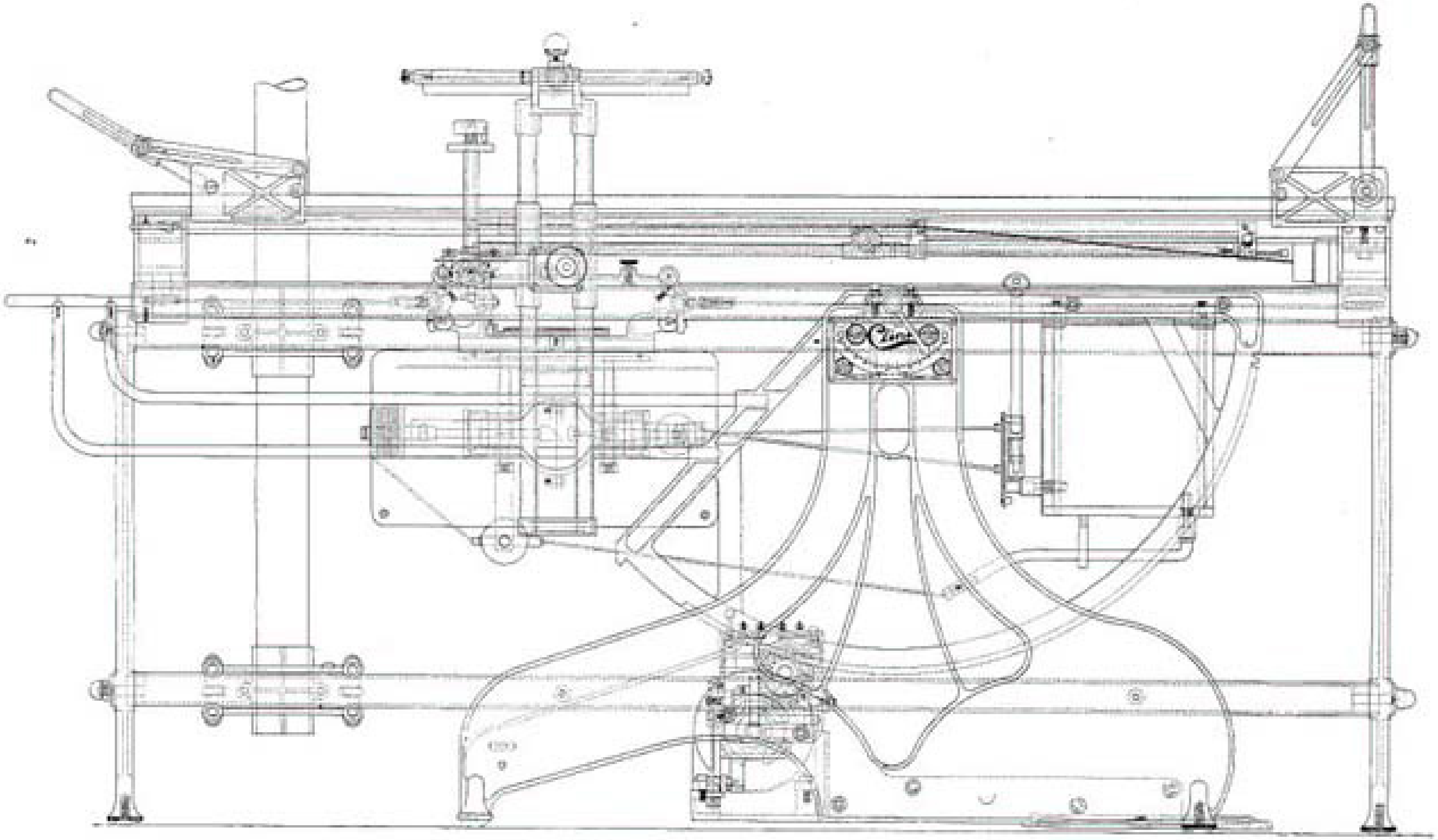
PRICES

	Catalog Number Complete Assembly	PRICE	
		Per Item	Total Complete Assembly
Campbell Clinix Tube Tilt Table with terminals at upper end arranged to excite tube under table from an interrupterless or other outside transformer—with Automatic Plate Changer, 11 x 14 Fluoroscopic Screen and Holder, 2—17 x 17 Cassettes, Head and Foot Boards, Cord Reels, etc., boxed ready for shipment. F. O. B. Detroit	2095	$1550.00	$1550.00
Motor Drive and Foot Switches (Cat. 2108)	2094	100.00	1650.00
High Tension Transformer attached under table (Cat. 2111, $450) with Control Case (Cat. 2112, $100)	2086	550.00	2200.00
Number 6 Tube Stand (Cat. 1013)	2087	300.00	2500.00
Extra High Tension Transformer for Tube Stand with mountings (Cat. 2093)	2109	450.00	2950.00
Two Coolidge Radiator X-ray Tubes (Cat 1270, $125 each)	2110	250.00	3200.00
Complete Clinix X-ray Plant (Catalog No. 2110) Code word Clinix	**2110**	**$3200.00**	**$3200.00**

NOTE:—This latter combination leaves nothing to be desired except the dark room equipment, illuminators and a few small accessories.

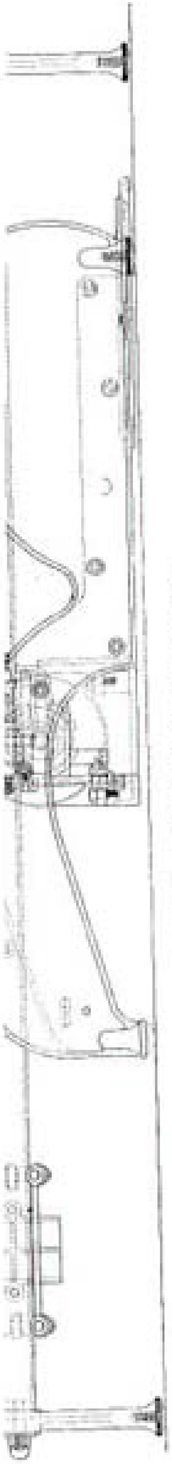
If supply is NOT alternating current of 100 to 120 Volt, 50 to 60 Cycle, one of the following must be used. May be installed in separate room or in basement if desired.

Cat. No. 1562 *Rotary Converter and Transformer for Direct Current, (10 milliamperes in Tube) 110 Volt*	$225.00
Cat. No. 2115 *Rotary Converter and Transformer for Direct Current, (10 milliamperes in Tube) 220 Volt*	275.00
Cat. No. 2113 *Rotary Converter and Transformer for Direct Current, 4 Kilowatt (30 milliamperes in Tube) 110 or 220 Volt*	525.00
Cat. No. 2114 *Step-Down Transformer 220 Volt or 440 Volt, 60 Cycle*	75.00



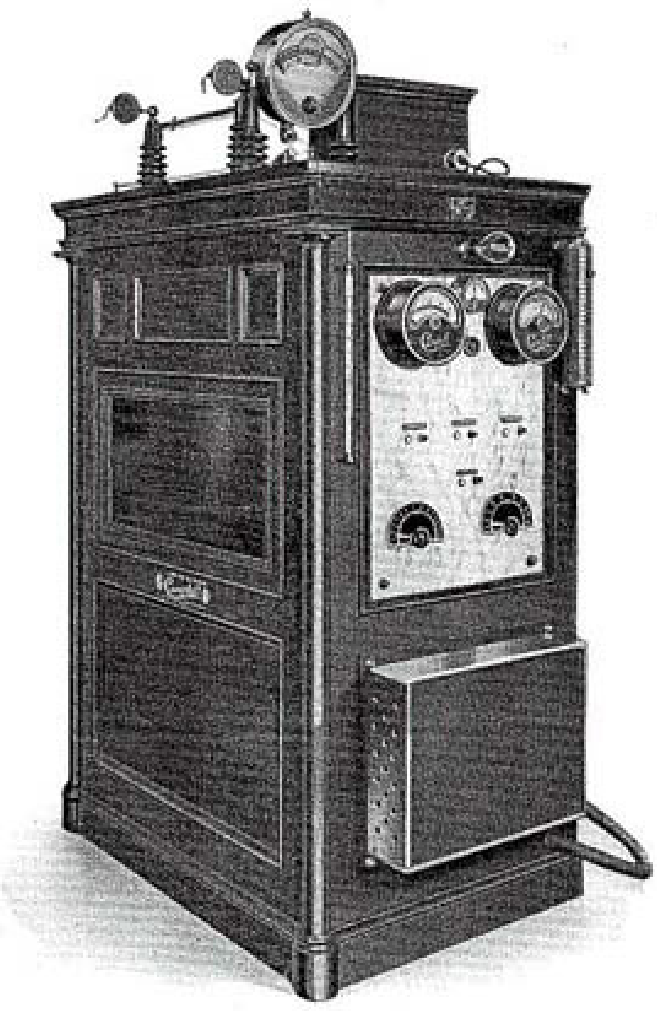
CAMPBELL "CLINIX" X-RAY PLANT

Line drawing, illustrating in detail, mechanical construction.

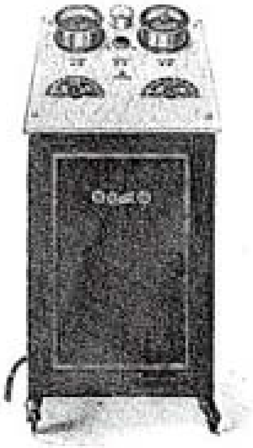


CAMPBELL "CLININ" X-RAY PLANT

Line drawing, illustrating in detail, mechanical construction.



Campbell Number 12 SureX Transformer



Separate Control Table for No. 12 SureX Transformer

VARIABLE VOLTAGE and VOLUME for VARYING DENSITY DETAIL

CAMPBELL NUMBER 12 SureX TRANSFORMER

Reduces Roentgenology to a Mathematical Science
For all kinds of Radiography, Fluoroscopy, and Radio-Therapy. Secondary Voltmeter.
Unit Rectifier. Polarity Indicator.
Auto Transformer.

In the early design of X-ray coils and transformers it seemed to be the idea that the apparatus must be very large and awe-inspiring in appearance, which was evidently the outcome of the necessarily large and cumbersome design of the earliest form of X-ray generator, the static machine.

In the design of the Campbell Sure X Transformer the modern idea of consolidation and utility of space has been adhered to, with the result that in this transformer is found in the smallest space possible and without unnecessary parts, an apparatus which delivers under perfect control all the power that may be utilized by the heaviest present day X-ray tubes, either gas or Coolidge type, and with ample reserve for future development of tubes.

In the first Sure X transformers placed on the market in 1912 were introduced many theretofore unknown features which have since been adopted as standard construction by the United States Army and Navy and are now demanded by roentgenologists who have used the Sure X. During the World War, Campbell Sure X Transformers were installed in more than one hundred of the principal Army and Navy hospitals in both this country and France; about two hundred are in use by the U. S. Government throughout the world. The U. S. A. camp hospitals on the Mexican Border are equipped with Sure X transformers. In the X-ray equipment of the Pershing Expedition, by both the Army and the Red Cross, the Sure X was used, a selection well merited by the previous excellent service of the Sure X on the Mexican Border and in various Army and Navy Hospitals.

By their continuous service under most trying conditions they have proven to be the most practical and durable X-ray transformers ever produced.

With the Sure X No. 12 the field of X-ray work is practically **unlimited** from the high penetration for deep therapy and radiography of the head and spine to fluoroscopy and instantaneous radiography of the gastrointestinal tract, heart, chest and rich contrasty soft tissue detail such as is required in radiographs of kidneys, gall stones, etc.

While a fixed penetration equivalent to a 5-inch gap will make a radiograph of any part of the body, there is a vast amount of difficult diagnostic work which requires variable penetration and volume.

SPECIFICATIONS

High Tension Transformer—Located in bottom of cabinet under rectifier which allows **direct** connection of high tension current from transformer to rectifier and from rectifier to terminals on top of cabinet, thus saving long runs and bends. Closed core—oil insulated—welded steel tank—telescopic secondary terminals (eliminate sparking). Method of winding and insulating prevents burn outs. Heavy copper windings insure uniform voltage with varying loads.

Auto Transformer Control—Provided with taps to give ten different voltages corresponding to approximately ½″ change in spark gap on each of the lower points.

Unit Type Rectifier—Self-starting motor—rectifier terminals supported from motor frame. Rectifying disc mounted directly on motor shaft. (This method of construction prevents terminals getting out of adjustment as is often the case when mounted on wood.) Rectifier disc cut away (**patented**) between contact surfaces preventing carbonization and consequent leakage on rectifier. Accurate synchronization of motor produces a unidirectional current that is practically absolute. Rectifier plate fastened and keyed to shaft so that it cannot change its position. Corrosion of motor is prevented by encasing high tension conductors with heavy rubber, which prevents electrical spray.

Polarity Indicator—Indicates polarity of high tension terminals. Operated by commutator attached to motor shaft in such a way that it does not interfere with ventilation of motor. Current operating indicator limited by resistance, which prevents burn out.

Rheostat—Resistance coils wound on porcelain tubes. Windings covered with fireproof coating, which prevents oxidization of the resistance wire and consequent burn outs.

Secondary Voltmeter—Indicates voltage at tube, necessary in order to accurately determine penetration of the X-rays. Connected in **secondary** circuit at neutral grounded point. This method of connection is **patented** and compensates for the **drop** in voltage in the primary and in wires leading to the transformer, giving more accurate indication of the secondary voltage than is the case when the voltmeter is connected to the **primary** circuit.

Cabinet—Of very substantial construction. Free moving casters. Standard finish is dark golden quartered oak. Mahogany finish also can be furnished. Any other finish is special.

Milliammeter—8" dial with two scales, 0-150 for radiography, 0-15 for fluoroscopy and therapy. Mounted on top of cabinet on high tension insulators.

Time Controller—Adjustable to automatically time exposure from one-tenth to five seconds.

Switchboard—Regularly attached to the transformer. No live contacts. Separate control table furnished if desired.

Separate Control Table—Constructed so that there are no exposed live contacts on the panel, thus eliminating the necessity of the use of glass or other methods to cover the switches. Switching is done by a magnetic device so that the small flush switches on the board are only required to make and break the circuit in the magnet which takes less than ½ ampere. Likewise the time controller is required to only operate the current in this magnetic circuit. The separate control table switchboard is provided with marble panel on which is mounted the secondary voltmeter, time controller, polarity indicator, pole changing switch, momentary contact switch for time exposure, permanent switch for long exposures and treatment, filament transformer switch, rheostat and auto transformer controls and filament transformer regulator. Switchboard is mounted on a small stand equipped with casters of special ball-bearing type. In the base of this frame is mounted the auto transformer, rheostat and magnetic switch. Suitable terminals are provided for cable from control table to cabinet.

PRICES

SureX No. 12 with secondary voltmeter—polarity indicator—auto transformer control—switchboard attached to cabinet. For use on Alternating Current ....
Extra for Separate Control Table instead of switch board attached to cabinet ......
Extra for use on Direct Current ......
Milliammeter ......
Time Controller ......
Lead Protective Shield. Separate or attached to corner of cabinet ......
Coolidge Tube Transformer and Regulator ......

Dimensions and Shipping Weights

Sure X cabinet, height 60", width (AC 34"—DC 40") depth 29", Shipping weight {AC 1500 lbs. DC 1700 lbs.}
Separate Control Table, height 34", width 21", depth 21", Shipping weight 350 lbs.

ıpported from motor frame. onstruction prevents termi- wood.) Rectifier disc cut and consequent leakage on al current that is practically :annot change its position. with heavy rubber, which

als. Operated by commu- : with ventilation of motor. rn out.

ngs covered with fireproof equent burn outs.

in order to accurately de- at neutral grounded point. **p** in voltage in the primary on of the secondary voltage :uit.

asters. Standard finish is Any other finish is special.

, 0-15 for fluoroscopy and

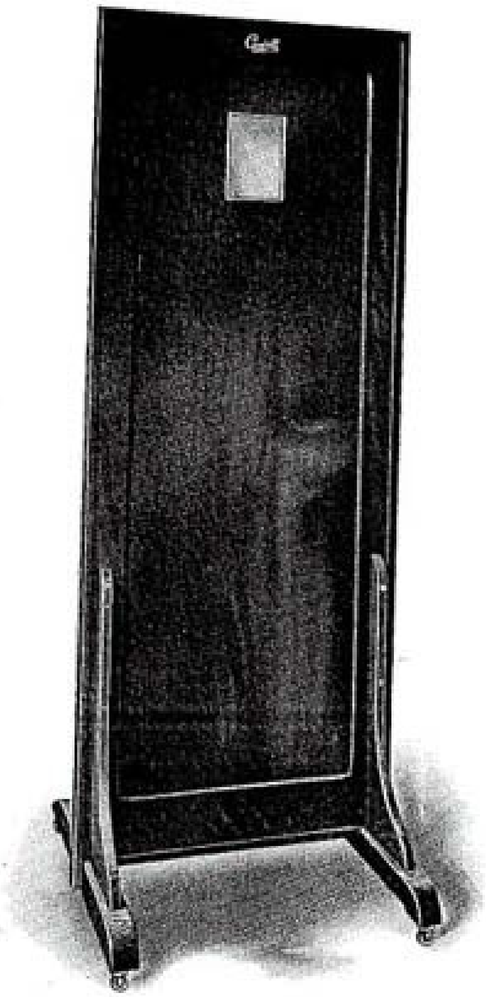
re from one-tenth to five

contacts. Separate control

xposed live contacts on the hods to cover the switches. ches on the board are only than ½ ampere. Likewise agnetic circuit. The sepa- ich is mounted the second- witch, momentary contact treatment, filament trans- ent transformer regulator. f special ball-bearing type. and magnetic switch. Suit-

uto transformer
ing Current....
› cabinet ......
....
....
....
....
....

ping weight {AC 1500 lbs. / DC 1700 lbs.}
weight 350 lbs.



Campbell Lead Protective Screen.

Cat. No. 1011

CAMPBELL
LEAD PROTECTIVE SCREEN

The Campbell Lead Protective Screen is for protection of operator from X-ray exposur It is important that every X-ray operator working with a "SureX" Transformer be equippe with a heavy lead screen, as the lead glass tube shield on the stand, although affording som protection, is not protection enough for one doing a considerable amount of work with suc powerful apparatus. Furnished, as illustrated, or hinged to corner of cabinet of SureX Tran former.

Handsomely finished hardwood frame lined with sheet lead with lead glass window. Oa and mahogany are standard finishes. All other finishes are special and cost extra.

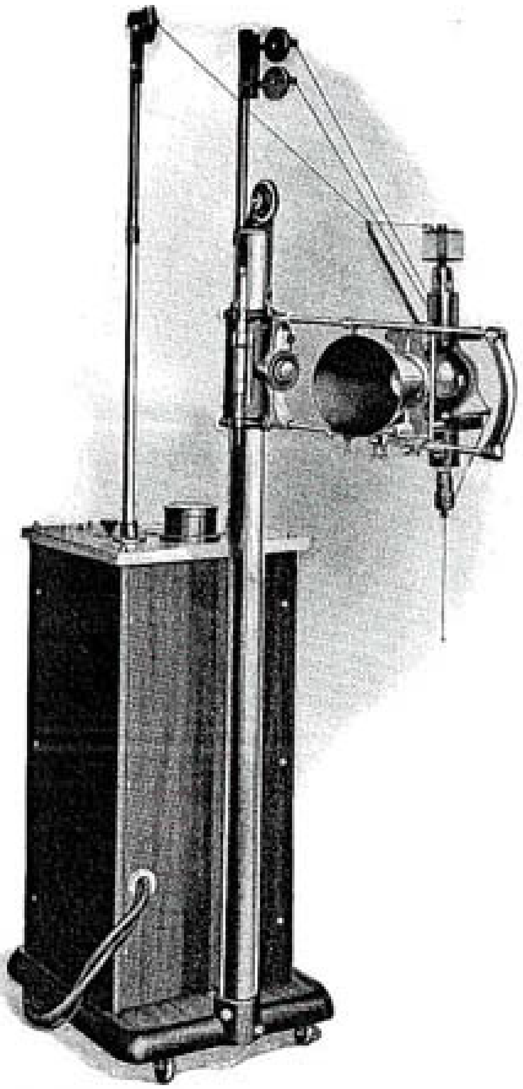
Height 6 feet, width 30 inches. Shipping weight 175 lbs.

Price, complete boxed ready for shipment .... [redacted]

tor from X-ray exposur
Transformer be equippe
, although affording som
mount of work with suc
f cabinet of SureX Trans

lead glass window. Oa
nd cost extra.

Campbell
Coolidge
Clinical
X-RAY UNIT



CAMPBELL CLINICAL X-RAY UNIT

U. S. Patents
December 19, 1911; April 22, 1913; August 7, 1917.
Other Patents Pending.

Cat. No. 2084

Campbell Coolidge Clinical X-RAY UNIT

CAMPBELL CLINICAL X-RAY UNIT

3-inch gap, 1 to 30 milliamperes; 4-inch gap, 1 to 30 milliamperes; 5-inch gap; 1 to 30 milliamperes.

For nearly every kind of Radiography and Fluoroscopy. Silent — Always ready — Uniform Results.

(Capacity — Any work within the range of 1 to 30 milliamperes with 3" t 5" spark gap)

(See U. S. Army Manual and Eastman or Campbell X-ray Exposure Rule.)

No Physician's, Dentist's nor Hospital's equipment is complete without a Campbell Clinical X-ray Unit.

The greatest hindrance to more universal use of X-ray has been the inability of the average operator to readily master the adjustment of the apparatus in order to obtain satisfactory results.

In the Campbell Coolidge Clinical X-ray Unit the **Current** and **Voltage** (which regulate time of exposure and penetration) are **Fixed Quantities** instantly ready for use by pressure o the switch, and without the annoyance of the noise and adjustments of spark gaps, tube vacuum etc.

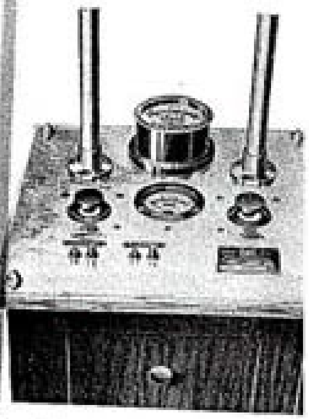
The apparatus is especially constructed with sufficient capacity and suitable regulation for operation of either the ten milliampere or thirty milliampere Coolidge Radiator self-rectifying X-ray tube with a 3" to 5" spark gap, which is sufficient to radiograph or fluoro scope any part of the body, thus approaching as nearly as possible all the advantages of the Sure X interrupterless transformer.

One of the principal advantages of this apparatus, which is fully covered by U. S. Patents, is that by slight adjustment of the voltage and current regulators the current may be changed to any volume from 1 to 30 milliamperes at a 3", 4" or 5" gap, always maintaining th selected voltage at the tube terminals regardless of the load which in the ordinary apparatus would cause fluctuation in the penetrative value of the X-rays, uniform maintenance of which is s necessary in order to establish the exposure technique which in results marks the differenc between the expert Roentgenologist and the one who is rated as of mediocre attainment.

This equipment in connection with Eastman Dupli-Tized films and double intens fying screens, one on either side of the film, will produce wonderfully rapid work. For Denta and the majority of other work, no screen is needed.

The entire apparatus is one complete unit easily moved about and is instantly read for use by connection to the ordinary electric light circuit for use with ten milliamperes in th tube, but for use of the thirty milliampere tube it is advisable to connect to a special circuit o No. 6 or 8 wire on account of fire underwriters' regulations relative to carrying capacities o wiring circuits.

The whole outfit is
s a model of efficiency, b
xperience in the manufac
hospital will offer to the pr



The Control Board

High Tension Transfo
ank Sufficient capacity to

Filament Transformer.
ansformer. Oil insulated.

Auto Transformer. C

Control. Voltage and v
cated on Control Board. Th
onsequent fluctuation of pen
ry finely controlled by turnin
adjusted by Voltage Regula
eter reads 110 volts, the spark
ck of line capacity may be
op in line voltage when load

Reels. For Connecting W

Foot Switch. Quick mak

Current Required. Oper
cles, 6 to 35 amperes, accordi
rotary converter mounted in
illiampere tube, it is necessary
om the cabinet.

NIT

to 30 milliamperes;
s.

Fluoroscopy.
Results.

illiamperes with 3″ to

xposure Rule.)

is complete without

s been the inability of the
order to obtain satisfactory

d **Voltage** (which regulate
eady for use by pressure on
of spark gaps, tube vacuum,

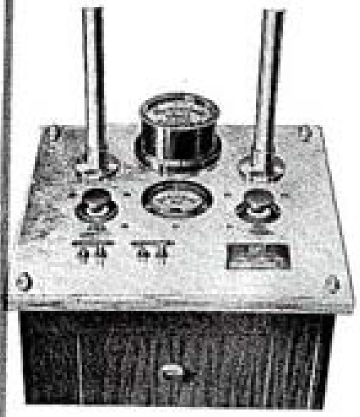
t capacity and suitable
liampere Coolidge Radiator
ent to radiograph or fluoro
e all the advantages of the

is fully covered by U. S.
gulators the current may be
ap, always maintaining the
e ordinary apparatus would
naintenance of which is so
sults marks the difference
nediocre attainment.

l films and double intensi-
rapid work. For Dental

bout and is instantly ready
ith ten milliamperes in the
nnect to a special circuit of
to carrying capacities of

The whole outfit is the evolution of many years of combined research work, and
s a model of efficiency, beauty and durability such only as this company of twenty years' xperience in the manufacture of all kinds of X-ray apparatus for the physician, dentist and ospital will offer to the profession.



The Control Board

SPECIFICATIONS

Cabinet. Fireproof, entirely of metal, beautifully finished, with white marble top, polished nickel trimmed. All parts of cabinet are interchangeable so that in case of injury a new panel, corner, base, or marble top may be quickly replaced without expense of an entire cabinet. This method of construction allows the ready removal of all four side panels, thus leaving all internal parts of the apparatus easily accessible, very rigid, and absolutely fireproof.

Equipped with ball-bearing casters attached to the cast base.

The regular finish is Mahogany.

Control Board. White marble equipped with voltmeter; milliamperemeter; spark regulator; filament regulator; auto transformer control; high tension masts with grounded metal casings; filament switch and main switch.

High Tension Transformer. Secondary 65,000 volts. Closed core, oil insulation, metal ank Sufficient capacity to deliver 1 to 30 milliamperes to the X-ray tube with 3″ to 5″ gap.

Filament Transformer. A separate transformer mounted in same case with high tension ransformer. Oil insulated.

Auto Transformer. Compensates for difference in line voltage.

Control. Voltage and volume are simultaneously regulated by turning a regulator handle ocated on Control Board. This method of control compensates for rise and fall in line voltage and onsequent fluctuation of penetrative value of the X-rays. Filament current may also be ery finely controlled by turning a regulator handle on front panel of cabinet. Auto Transformer s adjusted by Voltage Regulator on control board. By adjusting this regulator until the voltneter reads 110 volts, the spark gap desired is assured with any load, if line capacity is sufficient. ack of line capacity may be quickly determined by noting whether or not voltmeter indicates rop in line voltage when load is turned on.

Reels. For Connecting Wires. Self-winding, mounted on high tension masts.

Foot Switch. Quick make and break prevent arcing and burning of contacts.

Current Required. Operates on alternating current of from 100 to 120 volts, 40 to 60 ycles, 6 to 35 amperes, according to current used in tube. Also on direct current by addition f rotary converter mounted in bottom of cabinet for the ten milliampere tube. For the thirty nilliampere tube, it is necessary to mount the converter, on account of its large size, separate rom the cabinet.

Tube Stand. Counterweighted. Wide range of adjustment of tube with stereosco shift, vertical and horizontal. Highly finished in polished nickel plate. Mounted in hea cast base of cabinet.

Protection from X-ray. The standard and approved Coolidge special heavy glass tu shield completely enclosing tube. Made of lead glass equivalent in protection to approximat ⅛″ metallic lead.

Protection to Apparatus, Patients and Operator. No exposed current carrying pa on Control Board. Mica High Tension Masts with Metal casings grounded through resistan Standard approved cutout in bottom section of cabinet with cartridge fuses.

Tube. Self-rectifying Coolidge Radiator type, either the ten or thirty milliampere.

Patents. This apparatus is protected by U. S. patents issued December 19, 1911, Ap 22, 1912, and August 7, 1917. Other patents are pending.

OUTFIT

Coil. A. C., 110 volt, 60 cycles, including cabinet, transformers, regulators, meters, e Catalog No. 2084.
Tube Stand. Counterweighted. Stereoscopic. Catalog No. 1255.
Foot Switch. Carbon make and break. Catalog No. 1037.
Glass Shield. Lead protective. Bedside type. Catalog No. 1260.
Coolidge Tube. Bedside Radiator type, either the ten or thirty milliampere.

Catalog No. 1270.

Outfit complete, boxed ready for shipment F. O. B. Lynn ....
Extra for Automatic Time Controller (times exposure and breaks circuit). Catalog No. 2081
Extra for use on 110 volts, D. C. (10 milliamperes through tube) ....
Extra for use on 110 volts, D. C. (6 milliamperes through tube) ....

There is also a Campbell Coolidge Dental Unit which is designed for Dental X-ray clusively. It delivers 10 milliamperes at only a 3″ spark gap, which is ideal penetration the teeth, but not sufficient for sinus and other deep work.

There is a Campbell X-ray or Electrotherapeutic outfit for every known field of use.

Send for complete catalog.

Campbell Apparatus sold by Reliable Dealers, supported by Factory Service Men.

ACCESSORIES

The following accessories are suggested for selection to make a more complete outfit.

Hand Fluoroscope — Size 8″ x 10″ with Lead Glass. Catalog No. 1039 ....
Plate Changing Tunnel — Size 12″ x 12″. Catalog No. 1064 ....
Intensifying Screen and Cassette — Size 10″ x 12″. Catalog No. 1060 ....
U. S. Army Manual. Catalog No. 1150 ....
Eastman X-Ray Exposure Rule ....
Lead Lined Box for films and plates of all sizes. Catalog No. 1083 ....
Dark Room Supplies, Films, Plates, etc. (See price list).

CA

U. S. Patents:
19, 1911; April 22, 1913; August 7, 1917.
Other Patents Pending.

ıtment of tube with stereoscop
nickel plate. Mounted in hea

Coolidge special heavy glass tu
ent in protection to approximate

No exposed current carrying pa
ıings grounded through resistanc
artridge fuses.

e ten or thirty milliampere.

issued December 19, 1911, Ap

ısformers, regulators, meters, e

g No. 1255.
037.
g No. 1260.
r thirty milliampere.

n . . . .
s circuit). Catalog No. 2081
pe) . . . .
pe) . . . .

s designed for Dental X-ray
ıp, which is ideal penetration

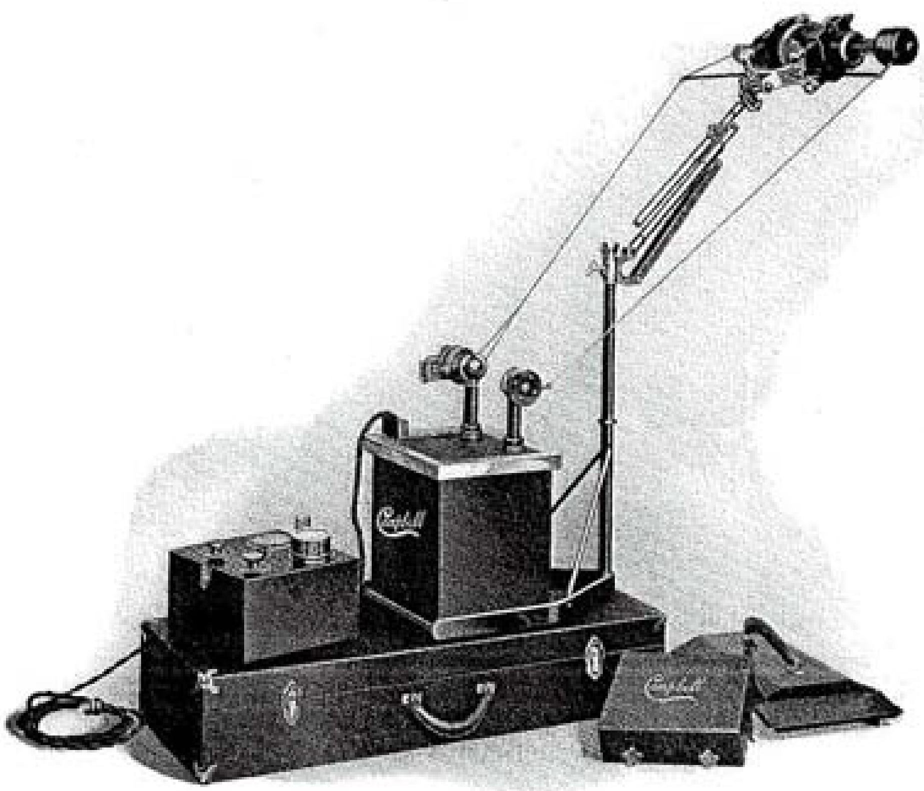
r every known field of use.

by Factory Service Men.

ıke a more complete outfit.

g No. 1039 . . . .
. . . .
No. 1060 . . . .
. . . .
. . . .
1083 . . . .

Campbell
ELECTRIC CO.
LYNN, MASS



CAMPBELL CLINETTE X-RAY UNIT
Portable Type for Bedside Use

U. S. Patents:
ec. 19, 1911; April 22, 1913; August 7, 1917.
Other Patents Pending.

Cat. Nos. 1592, 1593, 1594, 1260, 1270

Campbell Electric Co.
Lynn, Mass.

Campbell Clinette X-ray Unit Portable Type

3 to 5-inch gap, 0 to 30 milliamperes.

**Capacity:—Superb radiography of any part of the human body.
Average exposure time, one second. The best of fluoroscopy.
Designed for bedside use at home of the patient.**

Noted Roentgenologists using the Campbell Clinette portable unit marvel at the wonderf radiographs produced, which average much better than the work generally produced by the large and most powerful apparatus.

Transformer may be placed on floor beside bed and tube stand raised and extended to op posite side of bed.

The whole outfit may be carried, set up ready for use, in an automobile. The exposu may be made and outfit removed all in the average time which would be required to only a semble and connect the ordinary portable outfit.

The additional capacity provided in the Campbell Clinette (0 to 30 milliamperes) ove that of other portables on the market, makes it possible to do quicker and better work, also i sures against failure in those occasional, but so important, very difficult cases, only one of whic either directly or indirectly might be worth the cost of the entire outfit. When desired, onl ten milliamperes may be used or by simple adjustment of the regulators, various combinatio between 0 to 30 milliamperes and 3 to 5-inch gap may readily be obtained. Reference to th U. S. Army X-ray Manual and the Eastman Exposure Rule will demonstrate that this is suf cient capacity to radiograph or fluoroscope any part of the body.

One of the principal advantages of this apparatus, which is fully covered by U. S. Paten is that by slight adjustment of the voltage and current regulators the current may be changed various volume at a 3, 4 or 5-inch gap, always maintaining the selected voltage at the tube termin regardless of the load, which is so necessary in order to establish the exposure technique which results marks the difference between the expert Roentgenologist and the one who is rated as mediocre attainment. For instance, five, ten or twenty milliamperes may be obtained at *either* three, four or five-inch gap.

This equipment in connection with Eastman Dupli-Tized films and double intensifyi screens, one on either side of the film, will produce wonderfully rapid work. For Dental a the majority of other work, no screen is needed.

The whole outfit is the evolution of many years of combined research work, and is a mod of efficiency, beauty and durability such only as this company of twenty years' experience the manufacture of all kinds of X-ray apparatus for the physician, dentist and hospital w offer to the profession.

SPECIFICATION

Coil A. C. 110 volt, 60 Cycle, including self-winding cord reels, filament regulator, co necting cord, etc., Cat. No. 1592, including carrying case.

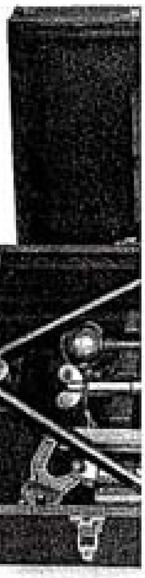
Control. Separate Auto Transformer Control with instruments, connecting cord, e Cat. No. 1593.

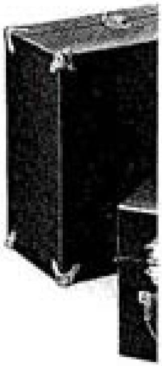
Tube Holder. Adjustable bracket, portable type, with base frame, extension rod, t clamps, cord spreaders, etc., Cat. No. 1594.

Tube Shield. Lead glass protective, bedside type, Cat. No. 1260.

X-ray Tube. Radiator bedside type, Cat. No. 1270.

Portable Rotary Converter for use on 110 Volt Direct Current (10 milliamperes in tu Cat. No. 1561.





Type

ıan body.
ıscopy.

·vel at the wonderful
roduced by the largest

l and extended to op-

ıobile. The exposure
e required to only as

0 milliamperes) over
l better work, also is
ses, only one of which
When desired, only
various combinations
ed. Reference to the
ate that this is suffi

ered by U. S. Patents
ent may be changed to
ge at the tube terminal
ure technique which is
ne who is rated as o
be obtained at *either*

d double intensifying
ork. For Dental and

work, and is a mode
years' experience
ntist and hospital wi

lament regulator, co

connecting cord, etc

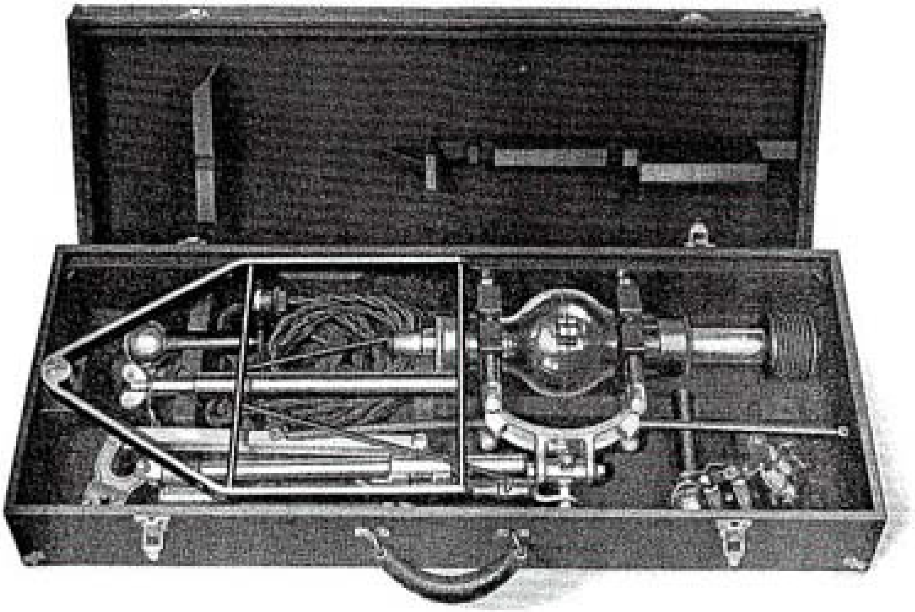
e, extension rod, tub

) milliamperes in tube

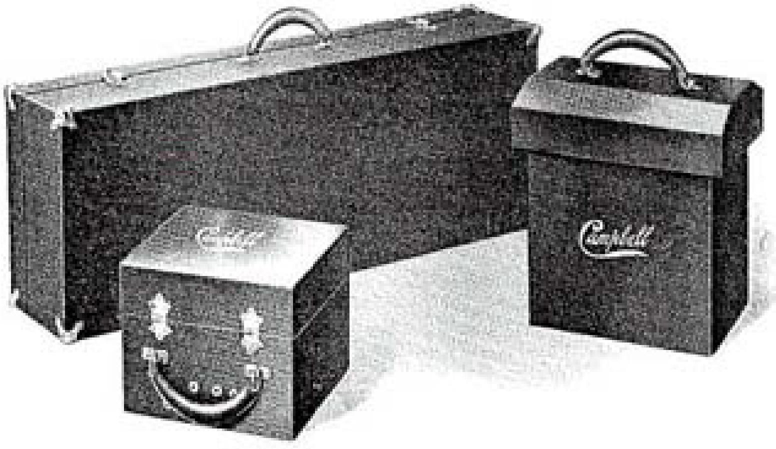
Campbell
Electric Co.
Lynn, Mass.

Campbell Clinette X-ray Unit

PORTABLE
POWERFUL
PRACTICAL



CLINETTE
CARRYING
CASE
PACKED



CAMPBELL
CLINETTE
OIL
CONTROL
AND
CARRYING
CASE
PORTABLE

Campbell
Electric Co.
Lynn, Mass

Essentials To Successful Roentgenology

See that films are loaded and developed in an absolutely light-proof room, by a safe rub light. Without screens, for better detail of soft parts, multiply the following screen exposur by 5.

Dense black films or dark gray all over, indicate over exposure or over penetration.

Light, thin, transparent films indicate under exposure or under penetration.

Films showing rich black and white detail are produced by using the lowest spark gap whic will provide sufficient penetration for the part to be radiographed—good light-proof dark room-safe ruby light—fresh unexposed films—fresh cool developer and fixer and washing for at lea twenty minutes in cool clean water. Cones, diaphragms, proper angles and immobility of sub ject also contribute to the making of good radiographs.

In placing film under patient, have center of target of tube opposite center of film, wi part to be radiographed directly in path of the central ray. In using double intensifying screen place film between the screens (in dark room) in light tight cassette or other exposure holde coated sides of screens toward film. Have the thinner screen of the pair toward the patient that the X-ray travels thru patient to the thin screen, thence thru film to the heavy scree This avoids shadows which might be caused by spots in the heavy cardboard of the heavi screen.

In mounting double screens in cassettes, the heavier screen should be attached to the cove

Note:—*Unexposed films and plates must be kept in properly constructed lead-lined box, hea iron safe or other X-ray proof protector which is absolutely certain to be closed during excitation the X-ray tube if only for one brief moment, as one flash of X-ray could completely ruin a whole sto of sensitive films or plates.*

Exposure Scale for use with Campbell Clinix, Clinical and Clinette X-ray Units.
Based on 150 lb. normal weight. Develop 5 minutes at 65 degrees F.

Part	Tube Distance Target to Film	Spark Gap Inches	Exposure Time Seconds — Milliamperes 10	20	30	Intensifying Screens	Film	Special
Fingers, Toes	20	3	2	1	⅔	None	Dupli-tized	
Teeth	20	4	4	2	1⅓	None	Dental (Fast)	
Hand	20	3	4	2	1⅓	None	Dupli-tized	
Wrist	20	3	4	2	1⅓	None	Dupli-tized	
Ankle	20	4	3	1½	1	None	Dupli-tized	
Chest	28	4	1½	¾	½	Double	Dupli-tized	
Tibia, Fibula	20	4	4	2	1⅓	None	Dupli-tized	
Elbow	20	4	5½	2¾	2	None	Dupli-tized	
Knee	20	4	1½	¾	½	Double	Dupli-tized	
Shoulder	20	4	1½	¾	½	Double	Dupli-tized	
Gastro-Intestinal	26	5	2	1	¾	Double	Dupli-tized	B. S. Meal
Cervical Spine	20	4	2	1	¾	Double	Dupli-tized	
Head (lateral)	20	4	4	2	1⅓	Double	Dupli-tized	
Kidney, Gall-Bladder		4	4	2	1⅓	Double	Dupli-tized	Compression
Hip, Pelvis Lumbar Spine	20	4	5½	2¾	2	Double	Dupli-tized	
Lateral Spine	28	5	8	4	3	Double	Dupli-tized	
Head (posterior-anterior)	20	5	5½	3	2	Double	Dupli-tized	Angle

The 20 Milliampere Technique has proven most uniformly satisfactory.
Secondary radiation is comparatively slight and radiographs consequently clear.

Fluoroscopy—This work is done with a current of 3 to 5 milliamperes with a penetrat equivalent to a 3" to 5" spark gap according to part and condition to be studied. The room m be absolutely dark. The light from the filament of Coolidge tube must be excluded. One sho remain in the darkened room for at least 15 minutes for sensitizing the retina before attempt to make fluoroscopic examination, otherwise the object to be examined may not even be visi If any light must be used temporarily, it should be a dim ruby light. A sensitive fluorosco screen should be used with proper lead glass, sheet lead or other protection. In this, as in X-ray work, the greatest care should be used against over exposure of patient, operator attendants, as well as persons in adjoining rooms. In doing fluoroscopic work, warn persons the room about moving, which will prevent injury by too close proximity to the tube, the w connected to same or otherwise. In no case should anyone approach nearer than within tw inches of the X-ray tube or wires connected to the same, and should not move without permis from the operator. Tube stands, metal tables, and frames should be permanently and effectu grounded by a strong stranded copper wire to a water or steam pipe which is not liable to disconnected from its ground.

genology

-proof room, by a safe rub
e following screen exposure

or over penetration.
penetration.
the lowest spark gap whic
good light-proof dark room-
ixer and washing for at lea
igles and immobility of sub

pposite center of film, wit
double intensifying screen
te or other exposure holde
e pair toward the patient s
u film to the heavy scree
y cardboard of the heavie

uld be attached to the cove
structed lead-lined box, hea
be closed during excitation
completely ruin a whole sto

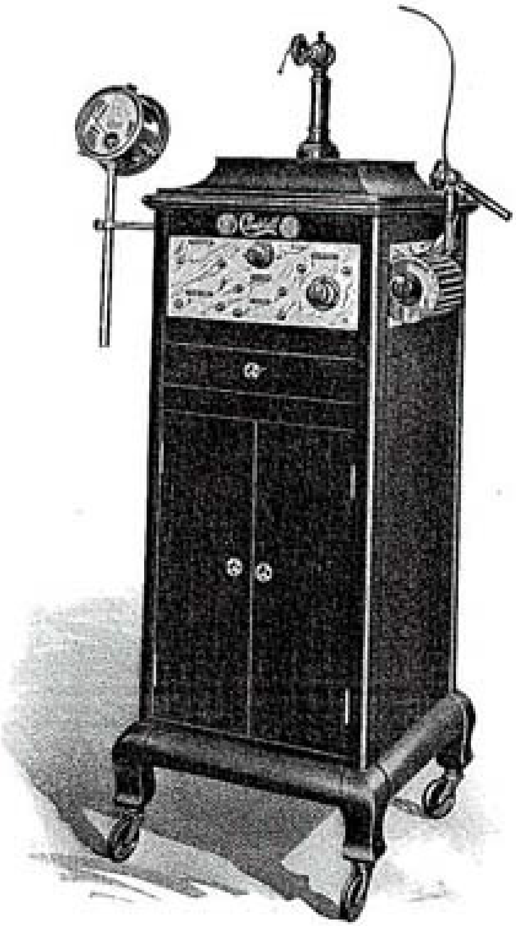
nette X-ray Units.
grees F.

Film	Special
Dupli-tized	
Dental (Fast)	
Dupli-tized	
Dupli-tized	
Dupli-tized	
Dupli-tized	
Dupli-tized	
Dupli-tized	
Dupli-tized	
Dupli-tized	
Dupli-tized	B. S. Meal
Dupli-tized	
Dupli-tized	
Dupli-tized	Compression
Dupli-tized	
Dupli-tized	
Dupli-tized	Angle

ctory.
ntly clear.

mperes with a penetrati
be studied. The room m
st be excluded. One sho
the retina before attempt
ed may not even be visib
ht. A sensitive fluorosco
otection. In this, as in
sure of patient, operator
copic work, warn persons
imity to the tube, the w
nearer than within tw
not move without permis
permanently and effectua
e which is not liable to

Campbell



Campbell Model I
X-ray and High-Frequency Coil

U. S. Patents
No. 1,012,326, Dec. 19, 1911.
No. 1,059,435, April 22, 1913.
No. 1,231.489, June 26, 1917.
Other patents pending.

CAMPBELL MODEL I

X-RAY AND HIGH-FREQUENCY COIL

X-RAY—AUTO CONDENSATION
CAUTERY—DIATHERMY
FULGURATION—SINUSOIDAL
CATAPHORESIS—DIAGNOSTIC LIGHT

The Campbell Model "I" X-ray and High-Frequency Coil furnishes nearly every known electric current of use to the physician, and is the final result of about twenty years' experience in the development and manufacture of high-frequency apparatus. The principles employed in its construction have withstood the test of time, and in spite of the efforts of various manufacturers to improve upon these principles, the result has been a slow but sure tendency toward Campbell principles. For instance, the Campbell spark gap has proved superior to rotary and enclosed gaps, and the obsolete Leyden jar condenser is made conspicuous by its absence. The method of construction of the transformer and Tesla coil, as used in the Campbell, is also conceded by recognized authorities as the best.

This apparatus is fully protected by patent No. 1,012,326, issued December 19, 1911, which covers nineteen claims essential to the production of a high-frequency coil that will be safe to itself, the operator, and to the patient. The transformer is protected by another patent, issued, April 22, 1913, No 1,059,435. The spark gap construction is covered by patent No. 1,231,489, issued June 26, 1917.

There are upwards of twenty thousand Campbell X-ray and High-Frequency Coils in use throughout the world, probably more than of all other makes of X-ray apparatus combined. Every part of the coil is manufactured in our own factory, employing only the highest grade of material and skilled labor, and every step of the work is constantly under the supervision of expert electricians. By means of improved machinery and methods of construction, extreme accuracy and uniformity are obtained, and every part from the hinges up is so standardized and so accurately assembled that any portion of the coil is interchangeable with the same portion of any other.

The Campbell Model "I" treatment and X-ray apparatus is the aristocrat of its class, a distinction earned by demonstrated worth and merit on one side and selection by the highest authorities on the other.

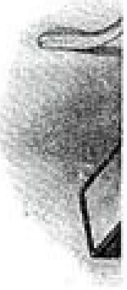
Current required—Alternating—110 Volts, 12 Amperes.

Currents it gives:—

1. **X-ray** covering radiographic work on shoulders and extremities, X-ray Therapy and Fluoroscopy.
2. **Oudin,** supplying all modalities in vacuum electrode treatments.
3. **D'Arsonval,** for auto condensation up to 2,500 milliamperes, through the hands, and higher according to surface of contact and condensing capacity of the patient, free from faradic sensation. Also, a current with faradic sensation if desired.
4. **Diathermic and Thermo-Faradic** to meet any requirement.
5. **Desiccation and Fulguration** in perfect form.
6. **Cautery and diagnostic light** in perfect form.
7. **Sinusoidal (rapid)** unsurpassed.
8. **Cataphoresis** and for operating small eye magnet.

The standard finish is oak or mahogany. All other finishes are special and cost extra.

Prices, Model "I" Coil for use on A. C., boxed complete ready for shipment....
Milliammeter with bracket, hot wire type ....
Extra for rotary converter for use on 110 volts D. C. ....
Extra for Compressed Air Pump with attachments and accessories ....
Dimensions, height to top of cabinet 44", width 18", depth 18".
Shipping weight, 200 lbs. (with pump 250 lbs.)



IL

r

ishes nearly every known
twenty years' experience
The principles employed
e efforts of various manu-
but sure tendency toward
roved superior to rotary
nspicuous by its absence.
d in the Campbell, is also

December 19, 1911, which
y coil that will be safe to
by another patent, issued,
by patent No. 1,231,489.

gh-Frequency Coils in use
-ray apparatus combined.
ng only the highest grade
tly under the supervision
s of construction, extreme
ges up is so standardized
ible with the same portion

e aristocrat of its class, a
d selection by the highest

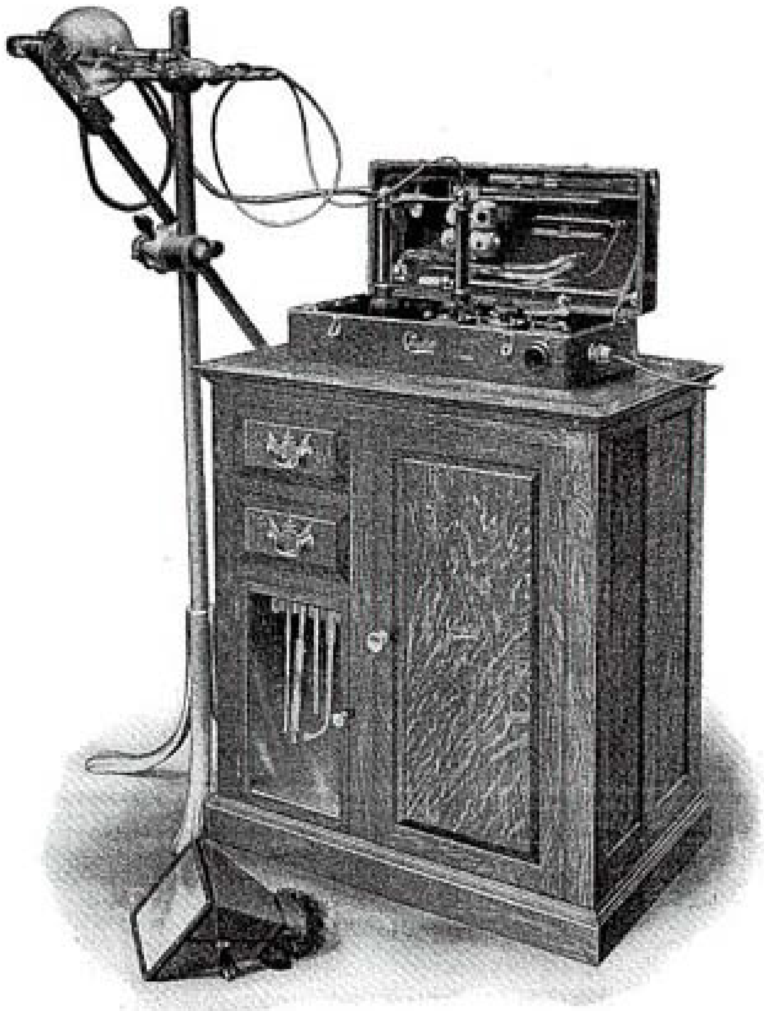
ities, X-ray Therapy and

nts.
s, through the hands, and
patient, free from faradic

t.

pecial and cost extra.
for shipment . . . .
. . . .
. . . .
s . . . .

Campbell



Campbell Model "E" Portable Coil
Outfit No. Six

CAMPBELL MODEL "E" PORTABLE COIL

The Campbell Model "E" Coil is the nearest to perfection of any portable coil ever manufactured. It is the coil that blazed the way to the now popular form of high-frequency currents and was used by thousands of prominent practitioners before any of our present competitors had built similar apparatus. It is the standard by which all others are measured.

In the Model E Coil is a closed core step-up transformer having a variable condenser combined with a variety of windings to produce the several currents, and combines, in one case, high and low voltage of high and low frequency for use of the physician. Its method of construction is protected by United States patents issued December 19, 1911, April 22, 1913, and June 26, 1917.

7 OUTFITS IN 1

This coil furnishes the following currents:—

X-ray—In connection with Tungsten Target Tube and Rubber Shield will make excellent radiographs of extremities.

Tesla—A very smooth even flow for operation of vacuum eletrodes and for High-Frequency Saturation in connection with Campbell Treatment Chair or Auto Pad.

D'Arsonval—500 to 2000 milliamperes through the hands and more according to surface contact and condensation capacity of patient, in connection with Campbell Treatment Chair or Auto Pad.

Diathermy for use in connection with moist electrodes and sufficiently powerful to produce appreciable heat in knee joint.

Sinusoidal (rapid) a low volt current for muscular treatment.

Cautery—For use with Campbell Cautery electrode handle and points.

Diagnostic Light—With regulating rheostat to secure any candle power needed for examining cavities of the body.

No live metal parts on top of coil except the two high tension terminals. Primary regulation has seven points and regulates volume in primary of transformer. Frequency regulator has four points and regulates frequency by condenser control. The lowest frequency is used for X-ray and High-Frequency Saturation, and the highest frequency for vacuum electrodes, auto condensation and diathermy treatment. This coil is recommended for use of the physician who desires a portable apparatus which, in addition to X-ray, furnishes all the various high-frequency and low-voltage currents.

Current required, alternating, 6 amperes, 110 volts. Regularly furnished for 60 cycles. Wound for other voltage and frequency on special order.

OUTFIT

Model "E" Coil, including connecting cord, cords for X-ray tube, portable tube stand, pair of metal hand electrodes and cords, handle for cautery and diagnostic lamp, cautery point and diagnostic lamp......

Cabinet......

Tungsten Target X-ray Tube (6 inch)......

Rubber Tube Shield......

Wood Floor Tube Stand......

Fluoroscope with P. B. C. Screen 5″ x 7″......

Vacuum Electrodes, set of six with handle......

Auto Pad......

Hot Wire Milliamperemeter and Bracket......

Met
elec

Leg Support
D'Arsonval

COIL

portable coil ever manu-
: high-frequency currents
our present competitors
measured.

variable condenser com-
mbines, in one case, high
s method of construction
l 22, 1913, and June 26,

ield will make excellent

and for High-Frequency
l.

re according to surface
npbell Treatment Chair

tly powerful to produce

oints.

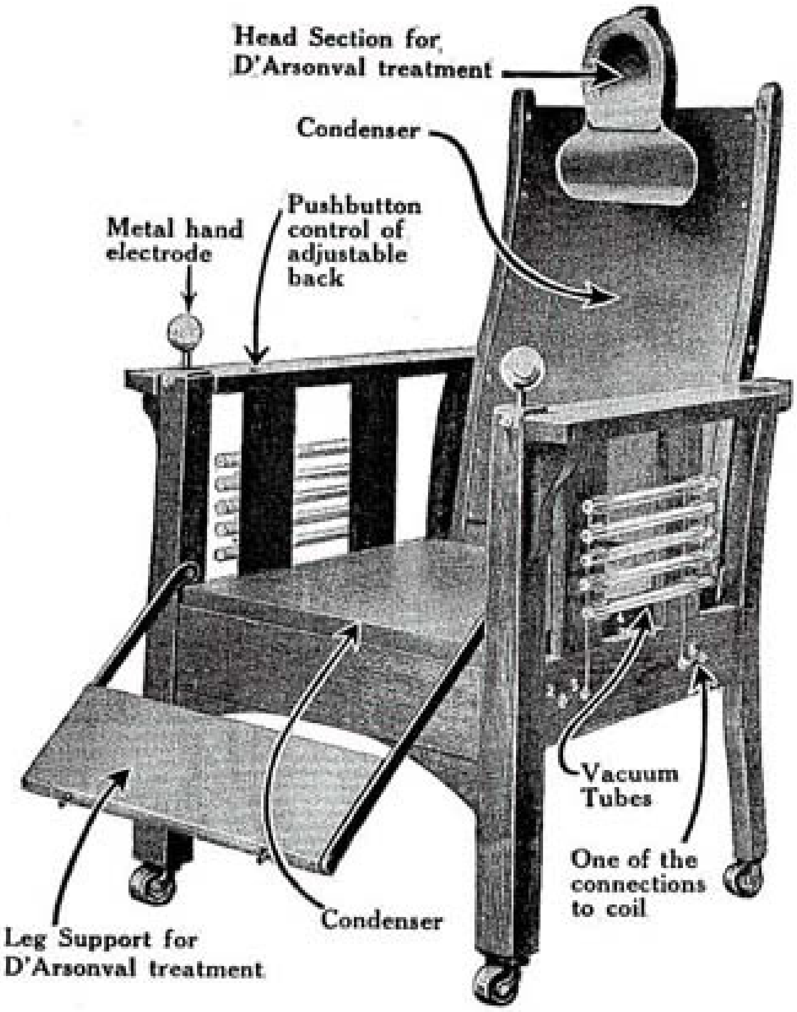
e power needed for ex-

ls. Primary regulation
requency regulator has
: frequency is used for
acuum electrodes, auto
r use of the physician
s all the various high-

urnished for 60 cycles.

, portable tube stand,
ic lamp, cautery point

Auto-Condensation—Auto-Conduction—Auto-Induction. Violet Ray–Also for applying Sinusoidal and Thermo Faradic Currents


Head Section for D'Arsonval treatment
Condenser
Metal hand electrode
Pushbutton control of adjustable back
Vacuum Tubes
One of the connections to coil
Condenser
Leg Support for D'Arsonval treatment

CAMPBELL HIGH FREQUENCY
"TREATMENT CHAIR"

(Patented)

Cat. No. 1525

CAMPBELL
HIGH-FREQUENCY TREATMENT CHAIR

In the Campbell High-Frequency Chair we present the most modern, convenient, and e fective means for administering the auto condensation treatment and other therapeutic curren ever offered the medical profession.

The back, seat, head and leg sections each consist of a separate condenser and may b connected altogether to one terminal of the coil, or may be connected independently to vario terminals, by which a variety of combinations and results may be obtained.

The most frequently used method is that of the application of the auto condensation curre in which the back, seat, head and leg sections are all connected together through the millia meter to one of the D'Arsonval terminals of coil. The pair of metal ball hand electrodes a connected together to the other D'Arsonval terminal of coil. This treatment is used in th reduction of high blood pressure, treatment of insomnia, and other conditions requiring a sedati effect.

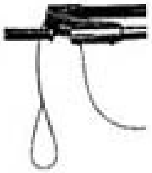
The next most frequently used method of application is High-Frequency Saturation i which back, seat, head and leg sections are connected together to the main post of coil, chargi the entire body with current capable of exciting a vacuum tube, at a distance of several fe from the patient, without wires, simply by conduction of current through the atmosphe This method of treatment is used where a stimulating effect is desired, and has been reporte by physicians as very effective in the restoration of irregular heart beating.

Another combination of connections may be made to localize the current in the back o the head, neck, and shoulders, which has been reported very effective in the treatment of hea aches and eye troubles brought on by straining over desk, bench, and machine work by offi and factory operatives. The vacuum electrodes may be connected so that they will rema lighted during treatment.

Many other combinations may be made to secure localization of the current to vario parts of the body.

Oak and mahogany are standard finishes. All other finishes are special and cost extra.

Price, complete with head and leg sections	[redacted]
Head Section	[redacted]
Leg Section	[redacted]



C

IAIR

odern, convenient, and ef-
other therapeutic currents

te condenser and may be
independently to various
btained.
auto condensation current
ther through the milliam-
l ball hand electrodes are
treatment is used in the
itions requiring a sedative

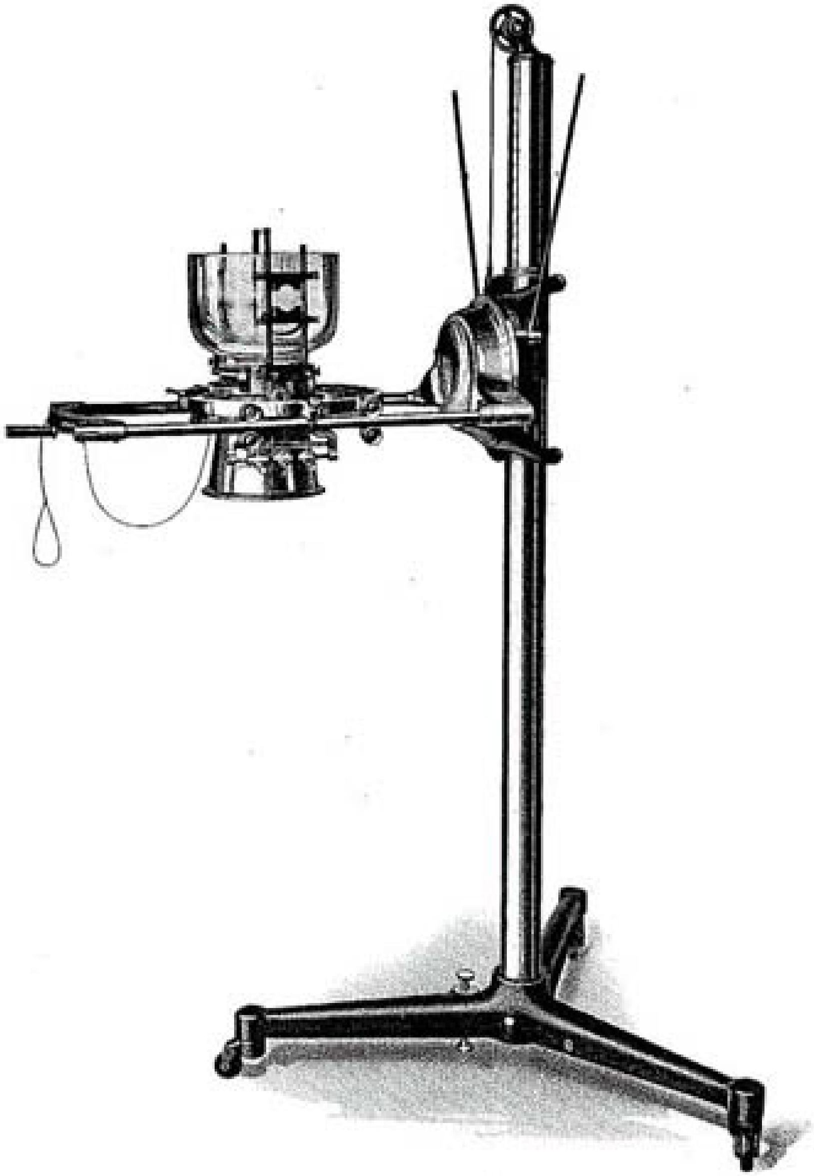
Frequency Saturation in
nain post of coil, charging
a distance of several feet
through the atmosphere.
d, and has been reported
ating.
e current in the back of
n the treatment of head-
l machine work by office
so that they will remain

f the current to various

special and cost extra.

. . . . [redacted]
. . . . [redacted]
. . . . [redacted]

Campbell



Campbell Stereoscopic Tube Stand No. 6.

Cat. No. 1013

NUMBER

SIX STEREOSCOPIC STAND

NUMBER SIX TUBE STAND.

CONTROLLED ENTIRELY FROM OPERATOR'S SIDE OF TABLE BY A SINGLE LEVER.

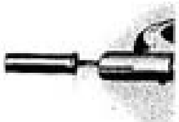
The Campbell Number Six Tube Stand was designed in response to an urgent demand fo a device of this sort by which X-ray might be employed in any position without resorting t unnecessary accessory appliances and with the least possible discomfort to the patient and annoyance to the operator.

This is the only Tube Stand on the market which is controlled entirely from the operator's side of the table by a single lever regardless of the position.

The Tube carriage may be swiveled in a complete circle and tilted and shifted for stereoscopic work at any degree of the circumference. The overhang of the tracks supporting tube carriage is sufficient to center the tube over either shoulder of a large patient without turning him o the table. There is an easily movable large friction disc which holds the tube carriage at any angle without necessity of tightening set screws, thus minimizing the danger of the tube accidentally turning upside down with liability of consequent injury to itself and patient.

All moving parts are equipped with high grade ball bearing rollers and there is a safety lock to prevent tube and carriage dropping in case cable breaks.

The cost of construction is necessarily expensive as compared with other stands, but fo the busy roentgenologist who wants the best its trifling extra cost is negligible.



SPECIFICATIONS.

Base—Cast iron—wide spreading—flat enough to go under average table—channeled t make it light in weight without making stand top heavy.

Upright—Steel tubing, height 75", counterweight runs inside.

Extension Tracks—Steel tubing, length 26".

Disc For Angle Adjustment—Large aluminum casting fitted to iron casting which runs on upright—carefully machined to provide suitable friction to hold tube at any angle—adjustment provided to regulate friction—when once set requires no further adjustment.

Tube Carriage—Aluminum castings accurately machined and highly finished—provides stereoscopic shift of tube independent of carriage movement and at any angle of the circumference. The flat and wide type of construction of this carriage eliminates all under-hanging metal parts which on other types of tube stands cast shadows and prevent covering a 14" x 17" plate without necessity of moving the tube to an excessive distance from the plate; also allows the employment of a large tube shield with extra large diaphragm opening, not possible with other makes of stands. All movements indicated by accurate calibration.

Lock—Single lever operates through right-hand track tubing and forces a fibre block firmly against upright. Does not scratch nor dent upright. Tension adjustable by machine screw in back of disc.

Diaphragms—Especially constructed for use as a treatment stand—an opening ¾" deep is provided to accommodate a number of filters of aluminum, leather or other material used to filter the rays in treatment and fluoroscopy. The tube may be brought in close proximity to the affected area.

Cones—of various sizes for all purposes may be quickly attached.

Price with lead glass shield, largest size lead diaphragm[redacted], complete, boxed ready for shipment—$300.

Height 75"—Shipping Weight 200 lbs.

NOTE—Wide-spreading light-weight base with floor lock.

: OF TABLE

ɔ an urgent demand for
on without resorting to
ort to the patient and

ɪrely from the operator's

l shifted for stereoscopic
upporting tube carriage
vithout turning him on
ıe tube carriage at any
anger of the tube acci-
lf and patient.
s and there is a safety

ı other stands, but for
igible.

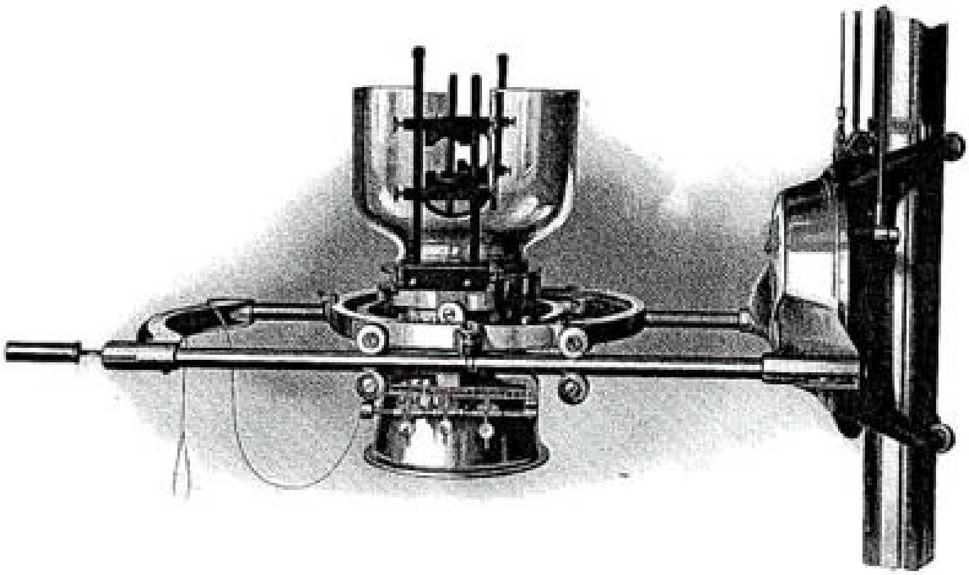
ge table—channeled to

ron casting which runs
at any angle—adjust-
ustment.
hly finished—provides
ıngle of the circumfer-
ıtes all under-hanging
ıt covering a 14" x 17"
the plate; also allows
ing, not possible with
on.
forces a fibre block
djustable by machine

ın opening $\frac{3}{4}$" deep is
ther material used to
in close proximity to

[redacted], complete, boxed

Campbell



Campbell Stereoscopic Tube Stand No 6.

Cat. No. 1013

NUMBER

SIX STEREOSCOPIC STAND

NUMBER SIX TUBE STAND.

CONTROLLED ENTIRELY FROM OPERATOR'S SIDE OF TABLE BY A SINGLE LEVER.

The Campbell Number Six Tube Stand was designed in response to an urgent demand for a device of this sort by which X-ray might be employed in any position without resorting to unnecessary accessory appliances and with the least possible discomfort to the patient and annoyance to the operator.

This is the only Tube Stand on the market which is controlled entirely from the operator's side of the table by a single lever regardless of the position.

The Tube carriage may be swiveled in a complete circle and tilted and shifted for stereoscopic work at any degree of the circumference. The overhang of the tracks supporting tube carriage is sufficient to center the tube over either shoulder of a large patient without turning him on the table. There is an easily movable large friction disc which holds the tube carriage at any angle without necessity of tightening set screws, thus minimizing the danger of the tube accidentally turning upside down with liability of consequent injury to itself and patient.

All moving parts are equipped with high grade ball bearing rollers and there is a safety lock to prevent tube and carriage dropping in case cable breaks.

The cost of construction is necessarily expensive as compared with other stands, but for the busy roentgenologist who wants the best its trifling extra cost is negligible.

SPECIFICATIONS.

Base—Cast iron—wide spreading—flat enough to go under average table—channeled to make it light in weight without making stand top heavy.

Upright—Steel tubing, height 75″, counterweight runs inside.

Extension Tracks—Steel tubing, length 26″.

Disc For Angle Adjustment—Large aluminum casting fitted to iron casting which runs on upright—carefully machined to provide suitable friction to hold tube at any angle—adjustment provided to regulate friction—when once set requires no further adjustment.

Tube Carriage—Aluminum castings accurately machined and highly finished—provides stereoscopic shift of tube independent of carriage movement and at any angle of the circumference. The flat and wide type of construction of this carriage eliminates all under-hanging metal parts which on other types of tube stands cast shadows and prevent covering a 14″ x 17″ plate without necessity of moving the tube to an excessive distance from the plate; also allows the employment of a large tube shield with extra large diaphragm opening, not possible with other makes of stands. All movements indicated by accurate calibration.

Lock—Single lever operates through right-hand track tubing and forces a fibre block firmly against upright. Does not scratch nor dent upright. Tension adjustable by machine screw in back of disc.

Diaphragms—Especially constructed for use as a treatment stand—an opening ¾″ deep is provided to accommodate a number of filters of aluminum, leather or other material used to filter the rays in treatment and fluoroscopy. The tube may be brought in close proximity to the affected area.

Cones—of various sizes for all purposes may be quickly attached.

Height 75″—Shipping Weight 200 lbs.—Price with lead glass shield, largest size lead diaphragm [redacted], complete, boxed ready for shipment—$300.

NOTE—Single lever lock controlled from operating side of table. Extra large size tube shield. Large friction disc to hold tube at any angle. Absence of lock handles at a distance from the operator.

F TABLE

ı urgent demand for
without resorting to
to the patient and

r from the operator's

ifted for stereoscopic
porting tube carriage
out turning him on
ube carriage at any
er of the tube acci-
nd patient.
nd there is a safety

her stands, but for
le.

able—channeled to

casting which runs
any angle—adjust-
nent.
finished—provides
e of the circumfer-
all under-hanging
overing a 14" x 17"
e plate; also allows
;, not possible with

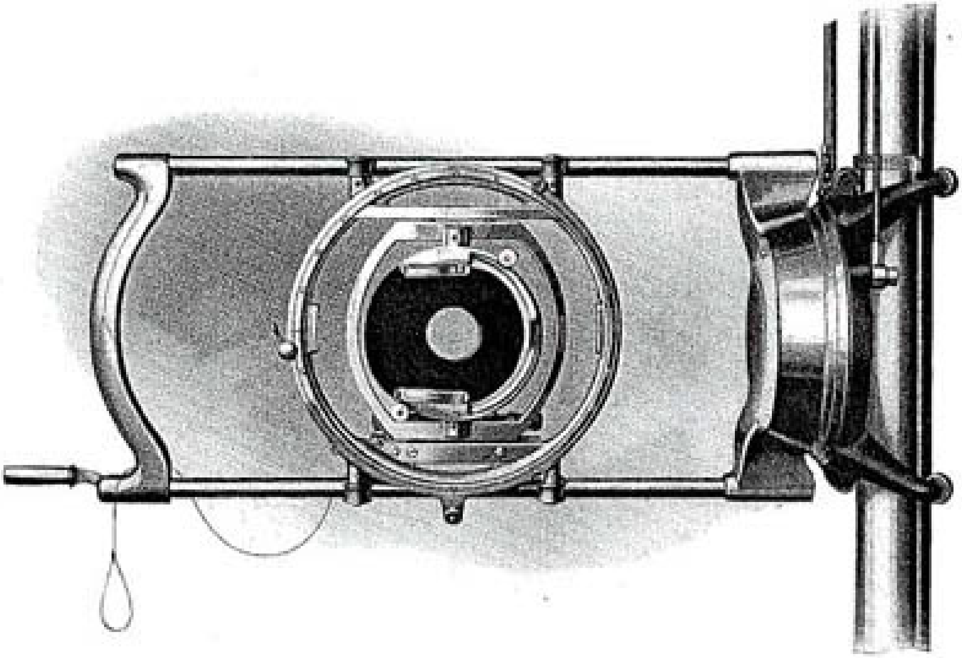
rces a fibre block
stable by machine

opening ¾" deep is
r material used to
close proximity to

gest size lead dia-

Extra large size
of lock handles

Campbell



Campbell Stereoscopic Tube Stand No. 6.

Cat. No. 1013

NUMBER

SIX STEREOSCOPIC STAND

NUMBER SIX TUBE STAND.

CONTROLLED ENTIRELY FROM OPERATOR'S SIDE OF TABLE BY A SINGLE LEVER.

The Campbell Number Six Tube Stand was designed in response to an urgent demand for a device of this sort by which X-ray might be employed in any position without resorting to unnecessary accessory appliances and with the least possible discomfort to the patient and annoyance to the operator.

This is the only Tube Stand on the market which is controlled entirely from the operator's side of the table by a single lever regardless of the position.

The Tube carriage may be swiveled in a complete circle and tilted and shifted for stereoscopic work at any degree of the circumference. The overhang of the tracks supporting tube carriage is sufficient to center the tube over either shoulder of a large patient without turning him on the table. There is an easily movable large friction disc which holds the tube carriage at any angle without necessity of tightening set screws, thus minimizing the danger of the tube accidentally turning upside down with liability of consequent injury to itself and patient.

All moving parts are equipped with high grade ball bearing rollers and there is a safety lock to prevent tube and carriage dropping in case cable breaks.

The cost of construction is necessarily expensive as compared with other stands, but for the busy roentgenologist who wants the best its trifling extra cost is negligible.

SPECIFICATIONS.

Base—Cast iron—wide spreading—flat enough to go under average table—channeled to make it light in weight without making stand top heavy.

Upright—Steel tubing, height 75″, counterweight runs inside.

Extension Tracks—Steel tubing, length 26″.

Disc For Angle Adjustment—Large aluminum casting fitted to iron casting which runs on upright—carefully machined to provide suitable friction to hold tube at any angle—adjustment provided to regulate friction—when once set requires no further adjustment.

Tube Carriage—Aluminum castings accurately machined and highly finished—provides stereoscopic shift of tube independent of carriage movement and at any angle of the circumference. The flat and wide type of construction of this carriage eliminates all under-hanging metal parts which on other types of tube stands cast shadows and prevent covering a 14″ x 17″ plate without necessity of moving the tube to an excessive distance from the plate; also allows the employment of a large tube shield with extra large diaphragm opening, not possible with other makes of stands. All movements indicated by accurate calibration.

Lock—Single lever operates through right-hand track tubing and forces a fibre block firmly against upright. Does not scratch nor dent upright. Tension adjustable by machine screw in back of disc.

Diaphragms—Especially constructed for use as a treatment stand—an opening ¾″ deep is provided to accommodate a number of filters of aluminum, leather or other material used to filter the rays in treatment and fluoroscopy. The tube may be brought in close proximity to the affected area.

Cones—of various sizes for all purposes may be quickly attached.

Height 75″—Shipping Weight 200 lbs.—Price with lead glass shield, largest size lead diaphragm [redacted], complete, boxed ready for shipment—$300.

NOTE—Tube carriage in position for vertical stereoscopic radiography. Inner circle of casting turns in outer circle, allowing stereoscopic shift and tilt at any angle.

E OF TABLE

to an urgent demand for
ition without resorting to
nfort to the patient and

tirely from the operator's

nd shifted for stereoscopic
supporting tube carriage
without turning him on
the tube carriage at any
danger of the tube acci-
self and patient.
ers and there is a safety

ith other stands, but for
gligible.

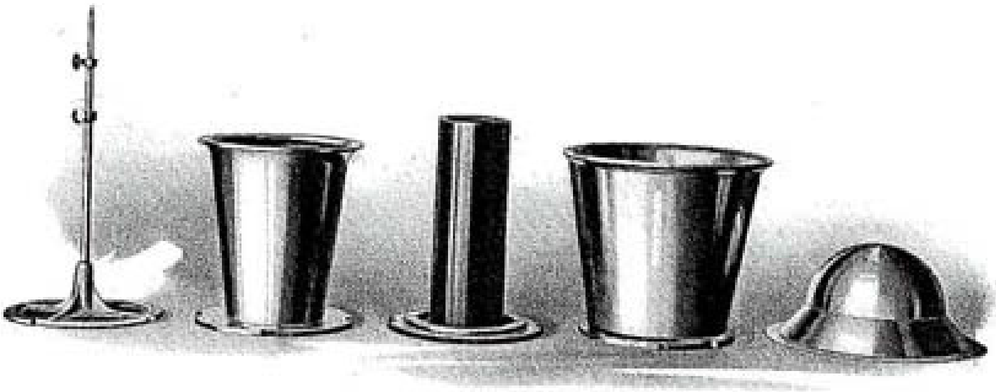
age table—channeled to

iron casting which runs
e at any angle—adjust-
ljustment.
ighly finished—provides
angle of the circumfer-
ates all under-hanging
ent covering a 14" x 17"
m the plate; also allows
ening, not possible with
tion.
d forces a fibre block
adjustable by machine

—an opening ¾" deep is
other material used to
t in close proximity to

largest size lead dia-

radiography. Inner
nd tilt at any angle.



Cones and attachments for Campbell Tube Stands

Centering Device	
A 6" aperture	*Cat. No. 1016*
C 2½" "	*" " 1018*
B 8" "	*" " 1017*
D Compression Cap	*" " 1019*

CONES AND ATTACHMENTS FOR CAMPBELL TUBE STANDS.

The cones for Campbell Tube Stands are constructed with an outer casing of aluminum highly polished, with an inner lining of lead which effectually confines the X-rays to the proper area.

The compression cap consists principally of an unlined aluminum cap which offers practically no resistance to the X-rays, and is used for securing compression in making kidney plates and similar work.

The centering rod is telescopic and may be extended for use in centering target of tube at various distances from the plate.

All of these attachments are furnished to fit the Campbell No. 12 Metal Tube Stand and the No. 6 Stereoscopic Tube Stand which is used with the Campbell Tube Tilt Table.

BE STANDS.

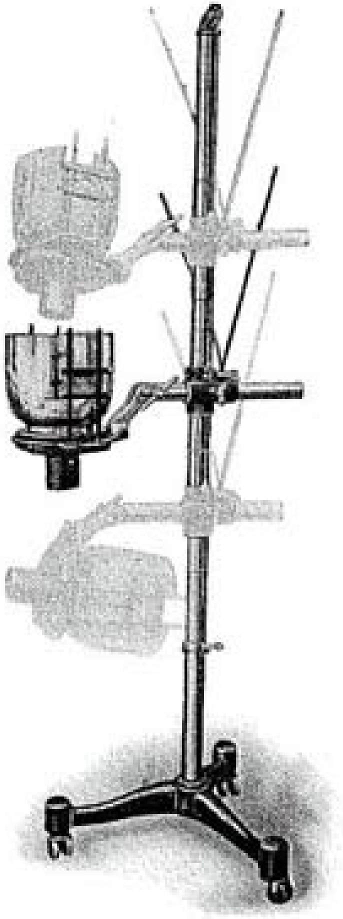
r casing of aluminum
e X-rays to the proper

p which offers practi-
n in making kidney

ring target of tube at

letal Tube Stand and
Tilt Table.

Campbell



Campbell No. 12 Metal Tube Stand.

CAMPBELL NUMBER TWELVE METAL TUBE STAND.

For Radiography and Treatment.

The Campbell Number 12 Metal Tube Stand is designed to meet the urgent demand for a counterweighted metal tube stand with lead glass shield for the general practitioner who does not care to go into X-ray work deeply enough to have use for all the attachments of the higher priced stands as used by the X-ray specialist.

As will be noted by the illustration this stand enables the operator to focus X-rays in all the various positions necessary for the average work, and fulfills the need of all but the exacting requirements of the X-ray specialist.

The design and method of construction with reference to use of high spark gap makes it especially desirable as a treatment stand.

SPECIFICATIONS.

Construction. Upright of steel tubing inside of which counterweight runs. Cast-iron base. Insulating material near tube terminals to permit use of high spark gap for treatment.

Diaphragms. Slot provided for use of various sizes of lead diaphragms to change size of exposure area.

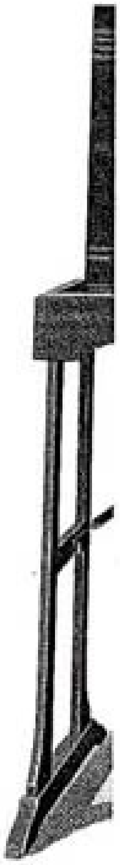
Tube Shield. Provided with heavy lead glass tube shield to accommodate up to and including 7" Coolidge or gas tubes.

Table. Provided with adjustable universal table for head work.

Cord Spreaders. Hold conducting cords in position.

Cones. Provision is made for attachment of various sized cones and cylinders for both treatment and radiography.

Finish. Polished nickel plate and enamel.



E STAND.

et the urgent demand for
l practitioner who does
tachments of the higher

r to focus X-rays in all
d of all but the exacting

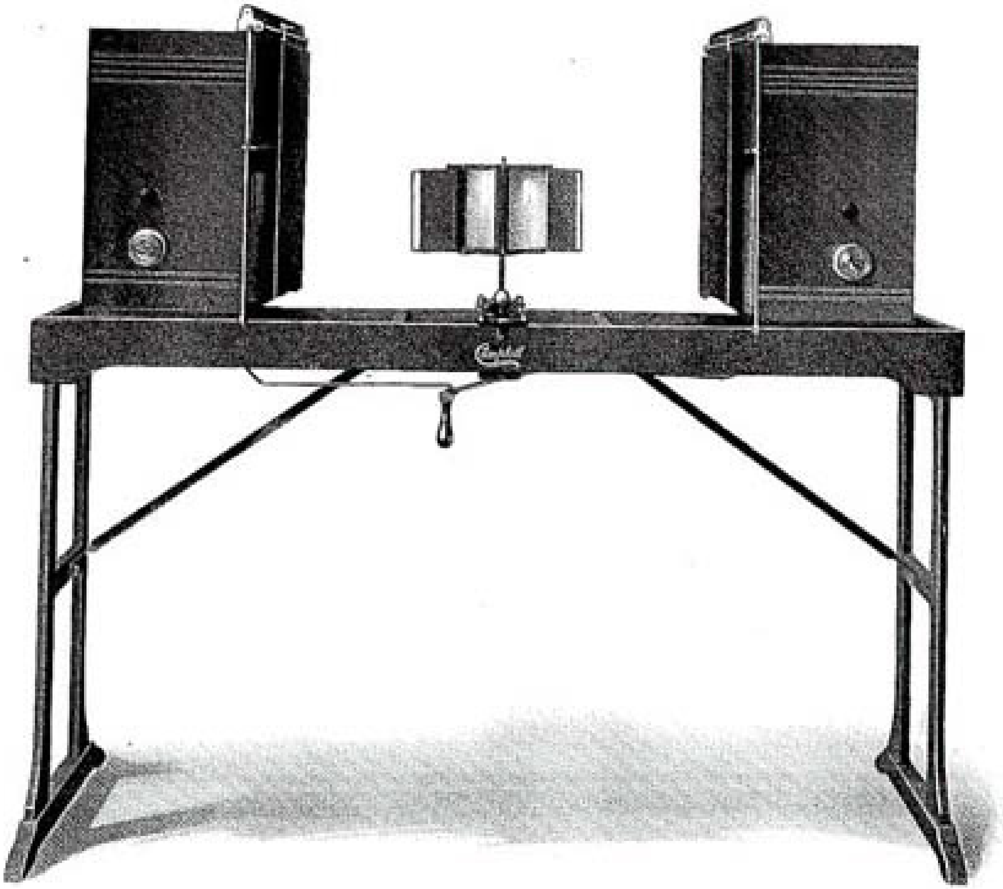
igh spark gap makes it

veight runs. Cast-iron
ark gap for treatment.

hragms to change size

commodate up to and

and cylinders for both



Campbell Stereoscope with Nitrogen Lamps and Dimmers

The Campbell Wheatstone Stereoscope is mounted on a substantial, finely finished wood frame, well balanced, and with large enough base so that the whole apparatus remains steady during adjustment. The lower handle shown in illustration adjusts simultaneously the position of the two view boxes in relation to the mirrors. High-grade glass mirrors are used in an adjustable cast frame.

The view boxes are made of metal finished to match the woodwork, and have ample ventilation. They are mounted on show case roller bearings, which admit of easy, quiet adjustment, and accommodate any size plate up to 14″ x 17″, either horizontally or vertically.

Adjustable curtains are made of rubberized cloth and mounted on spring rollers.

Each box is equipped with nitrogen lamps and high-grade opal glass. The reflection is so arranged than an evenly diffused light is thrown upon the plate to be examined, and the light may be regulated by switches or dimmers to suit the most dense or the thinnest plate.

All metal parts are highly finished in polished nickel plate and enamel. Mahogany and oak are standard, all other finishes are special.

ial, finely finished
apparatus remains
simultaneously the
mirrors are used in

have ample venti-
quiet adjustment,
ally.
ng rollers.
The reflection is
xamined, and the
thinnest plate.
Mahogany and

Campbell

X-RAY SUNDRIES

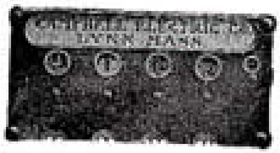
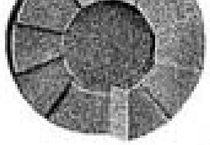


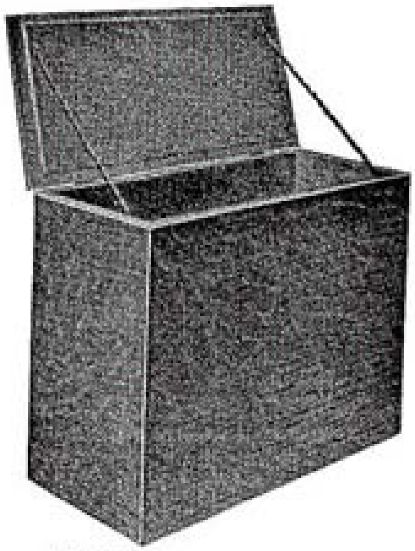
PLATE MARKER. Provides absolute identification of every X-ray plate by a serial number corresponding with record file of case. The only system of identification which is unquestionable. Numbers from 0 to 10,000. In ordering, state how you want name.

Cat. No. 1088

BENOIST PENETROMETER. To repeat your successes and avoid your failures in radiography it is necessary that you make accurate record of penetration of tube on every plate made. This little inexpensive device placed on plate during exposure leaves a clear permanent record of the penetration used.

Cat. No. 2063





LEAD LINED PLATE BOX

LEAD LINED BOXES X-ray plates and films are so extremely sensitive to the X-ray that they are not safe even when located a number of rooms away from the apparatus unless stored in lead lined boxes.

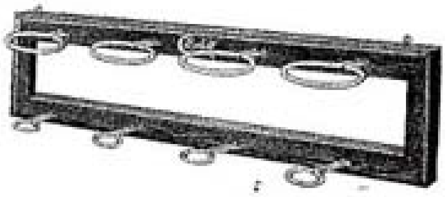
FILM CHEST. Made of metal, nicely finished, lead lined, accommodates small plates and several packages of dental films.

Cat. No. 2043

PLATE BOX. Highly finished case with lining of heavy sheet lead. The box illustrated affords ample protection if kept closed while tube is in operation.

Cat. No. 1083

TUBE RACK. Made of nicely finished oak, rubber covered metal rings to hold X-ray tube. Made in sections to hold any number of tubes. The price of one broken tube would pay for several of these racks.

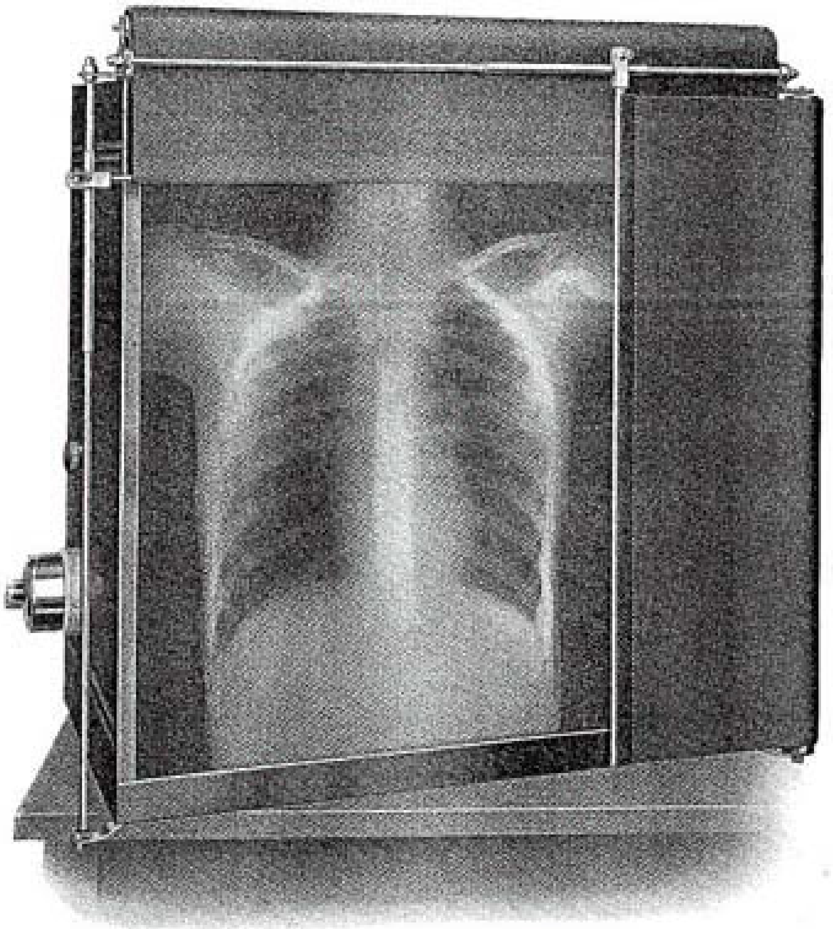


Cat No.	
1084	1 Unit
1085	2 Unit
1086	4 Unit
1087	6 Unit

Campbell

VIEW BOX

(Plate Illuminator)

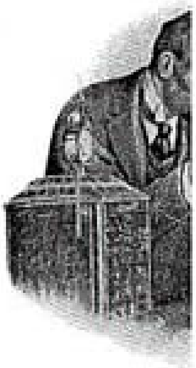


Consists of one of the illuminating boxes used with the Stereoscopic Illuminator. Is fitted with dimmer and nitrogen lamps adjusted in such a manner as to allow regulation of the light to bring out every detail of the X-ray plate, and makes valuable for diagnosis, plates which with other means of illumination would have absolutely no diagnostic value.

Boxes made entirely of metal, well ventilated, and finished in oak or mahogany. A special opal glass is used, covered by waterproof curtains mounted on spring rollers adjustable to plates up to and including size 14" x 17", in either horizontal or vertical position.

Complete with lamps, dimmer, cord, and plug ready for connection to 110 volt lighting socket.

Cat. No. 1035



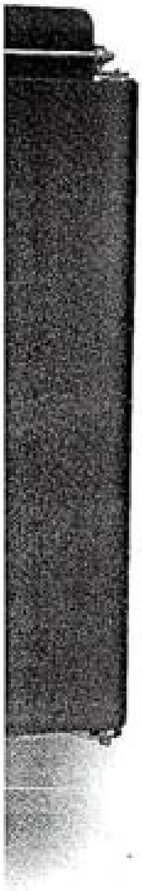
The High-Fre
useful in dentistry
increased to the
and for this reas
treatment of pyor
and all other con
desired.

A mild high-
produce a sedativ

1. Surface
4. Pyorrhea

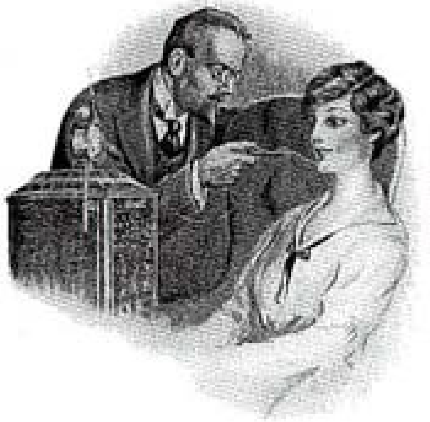
Set

o

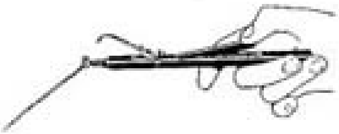


Illuminator. Is fitted
regulation of the light
iagnosis, plates which
due.
mahogany. A special
rs adjustable to plates
1.
1 to 110 volt lighting

Cat. No. 1035



FULGURATION ELECTRODE



This electrode is intended for the removal of warts, moles, naeve and similar growths by the local application of a spark. It consists of a metal pointed electrode which is connected directly with the Tesla terminal of the coil. It allows accurate localization and rapid withdrawal when sufficient spark has been applied.

Cat. No. 1552

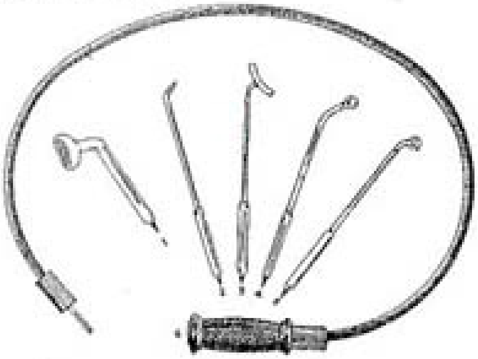
INSULATED DENTAL ELECTRODES

The High-Frequency current is found to be very useful in dentistry as a strong stimulant which may be increased to the point of counter-irritation if desired, and for this reason is being successfully used in the treatment of pyorrhea alveolaris, gingivitus, periodontitis and all other conditions where increased metabolism is desired.

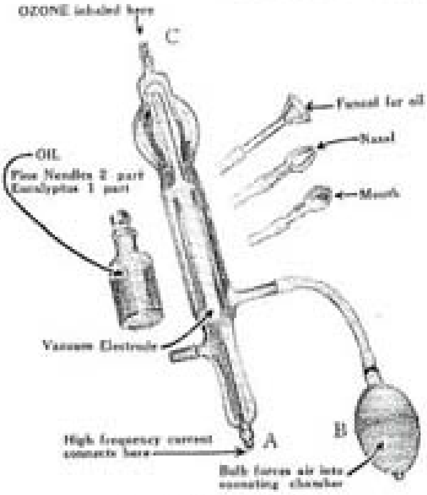
A mild high-frequency current may be used to produce a sedative effect, and will relieve congestion.

1. Surface
2. Cavity
3. Gum
4. Pyorrhea
5. Cataphoric
6. Handle

Set with handle Cat. No. 2015



OZONE GENERATOR


OZONE inhaled here
C
Funnel for oil
Nasal
Mouth
OIL
Pine Needles 2 part
Eucalyptus 1 part
Vacuum Electrode
High frequency current connects here
A
B
Bulb forces air into ozonating chamber

CAMPBELL OZONATOR
for use with Campbell High Frequency Coil

Has a Vacuum Chamber for Connection with High-Frequency Current from a Campbell Coil.

Ozone passes through a neutralizing oil.

Coil connected at "A," air is forced with rubber bulb at "B," and ozone inhaled at "C."

Equal to a $500.00 Ozone Apparatus.

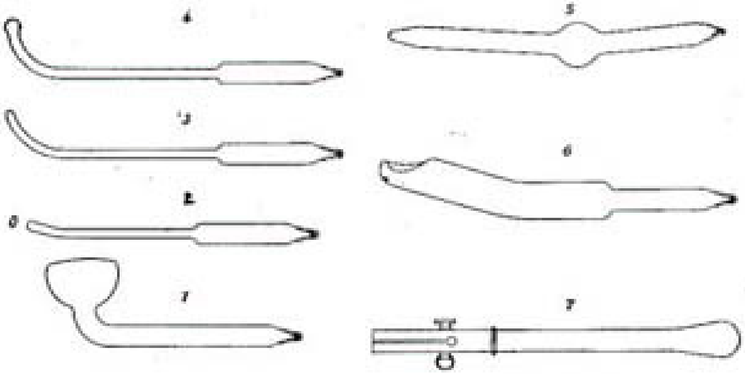
Cat. No. 1556

Campbell

VACUUM ELECTRODES

(For High-Frequency Coils)

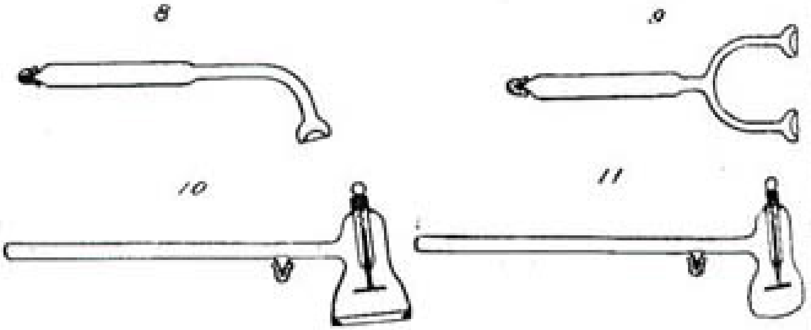
PLAIN



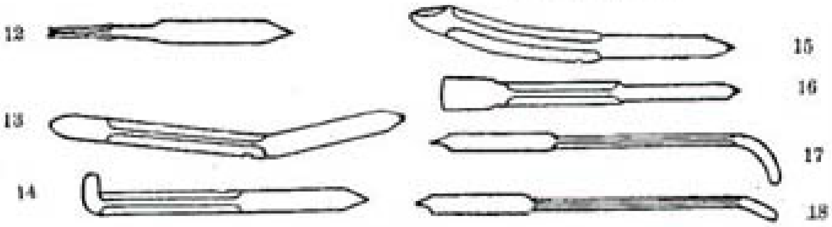
		Cat. No.
1.	Surface	1531
2.	Nasal	1535
3.	Urethral	1534
4.	Throat	1536
5.	Rectal	1533
6.	Vaginal	1532
7.	Handle	1537

SPECIAL

Cat. No.		
1545	8.	Single Eye Electrode
1546	9.	Double Eye Electrode
1547	10.	Cataphoric Electrode
1548	11.	Localizing Surface Electrode.



INSULATED



12. Ear, Cat. No. 1543 13. Rectal, Cat. No. 1539 14. Post Nasal
15. Vaginal, Cat. No. 1538 16. Tongue 17. Urethral, Cat. No. 1540
18. Nasal, Cat. No. 1541

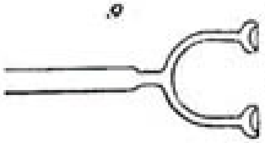
WORK IN CAVITIES. For this form of treatment the special electrode adapted to part should be used. It should be placed in situ before the current is turned on, and the current should be turned off before its removal. Introduction may be facilitated by lubrication of electrode. The sensation is one of warmth only, and owing to the sensitiveness of the mucous membranes and the fact that the electrode is to remain stationary, treatment should not be longer than from three to seven minutes, else there may be produced a local, direct burn. From the tendency of the current to leave the electrode at the first point of contact, it is best to use insulated electrodes in cavity work. **Caution.**—Be sure that metal sleeve of electrode, also connecting cord, do not come near enough to patient to allow direct spark discharge. Test current on yourself before applying to patient. This current is hot, and under favorable circumstances will ignite inflammable material; therefore use it with care when treating through flimsy clothing and do not apply it in the immediate vicinity of an oily or collodion dressing.

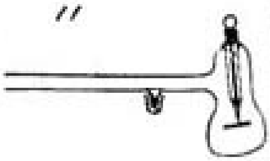
LUBRICATION OF ELECTRODES. As all oily substances are natural insulators, it is necessary to lubricate electrodes for internal work with one of the mucoid lubricants.

CARE OF ELECTRODES. Be sure that, like all surgical instruments, your electrodes are properly cleansed after each use. Being entirely of glass, this may be accomplished by means of antiseptics or by boiling. If you are treating any specific cases, *keep an individual electrode* for each patient.

For ordinary cleansing, it is sufficient to use a piece of surgical gauze moistened with denatured alcohol, and every electrode should be so cleansed before use.

		Cat. No.
1.	Surface	1531
2.	Nasal	1535
3.	Urethral	1534
4.	Throat	1536
5.	Rectal	1533
6.	Vaginal	1532
7.	Handle	1537





'ORK IN CAVITIES. For
form of treatment the spe-
electrode adapted to part
ıld be used. It should be
ed in situ before the current
ırned on, and the current
ıld be turned off before its
oval. Introduction may be
itated by lubrication of elec-
e. The sensation is one of
nth only, and owing to the
tiveness of the mucous mem-
es and the fact that the elec-
: is to remain stationary,
:ment should not be longer
from three to seven min-
ıve the electrode at the first
ıt metal sleeve of electrode.
t current on yourself before
mmable material; therefore
inity of an oily or collodion

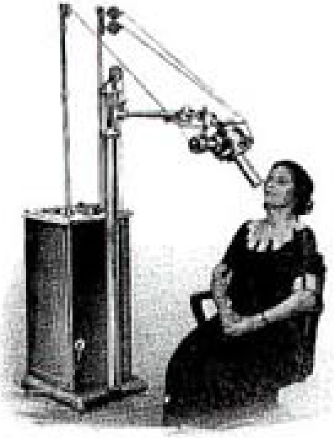
necessary to lubricate elec-

are properly cleansed after
g. If you are treating any

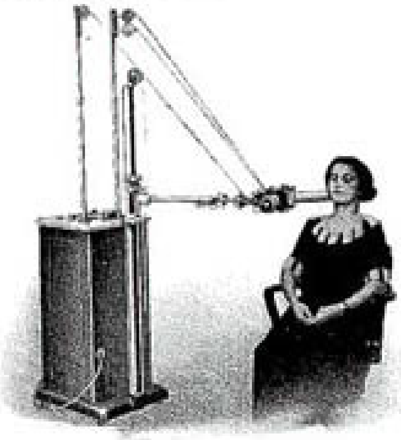
red alcohol, and every elec-

Campbell

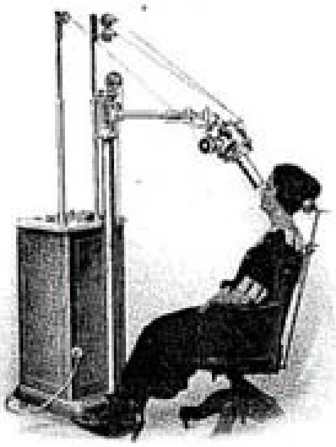
THE SIX DENTAL POSITIONS



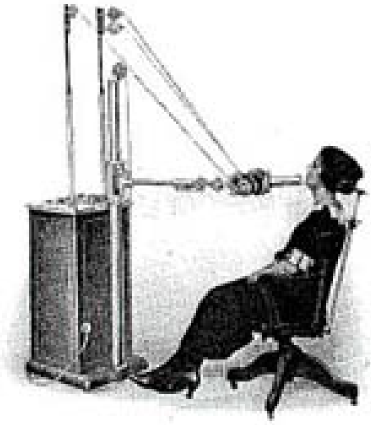
UPPER MOLAR *Campbell*



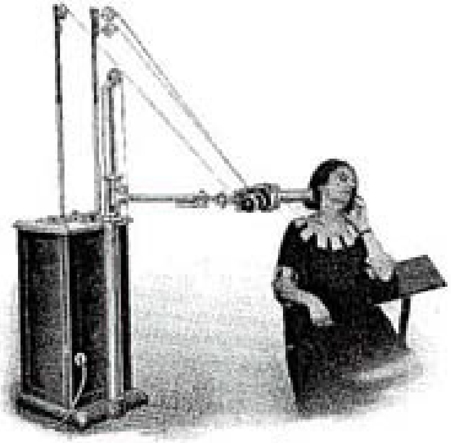
LOWER MOLAR *Campbell*



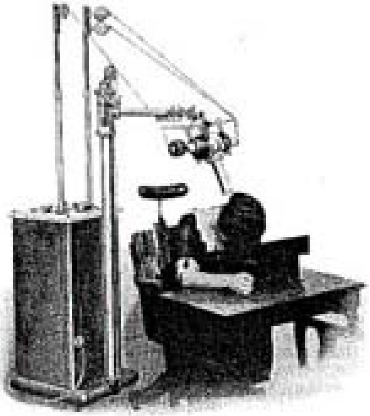
UPPER INCISOR *Campbell*



LOWER INCISOR *Campbell*



LATERAL JAW *Campbell*



FRONTAL SINUS AND ANTRUM *Campbell*

CAMPBELL CLINICAL DENTAL X-RAY UNIT

Campbell
Coolidge
Clinical
X RAY UNIT

As Applied To Dentistry

With Dental Tube Stand. Counterweighted. Vertical and horizontal stereoscopic shift for stereo radiography. Adjustable as to height as well as to distance from machine to patient.

3 to 5-inch Gap—1 to 30 milliamperes. That this range of voltage and volume is sufficient for radiography or fluoroscopy of any part of the body is corroborated by the U. S. Army Manual and the Eastman X-Ray Exposure Rule.

Sinus and Antrum work is possible with this apparatus which could not be done with the ordinary dental unit giving only a 3-inch spark gap on account of lack of sufficient penetration.

The radiographic possibilities of this outfit are limited only by the ingenuity of the dentist to apply it.

Campbell X-Ray and High Frequency Apparatus is and has been the leader for many years. When you buy Campbell apparatus you get the benefit of twenty years' experience in the manufacture of X-Ray apparatus. Why experiment? Buy something tried and true. Get the best. Buy a Campbell.

See dental positions on other side

Campbell
ELECTRIC CO.
LYNN, MASS.

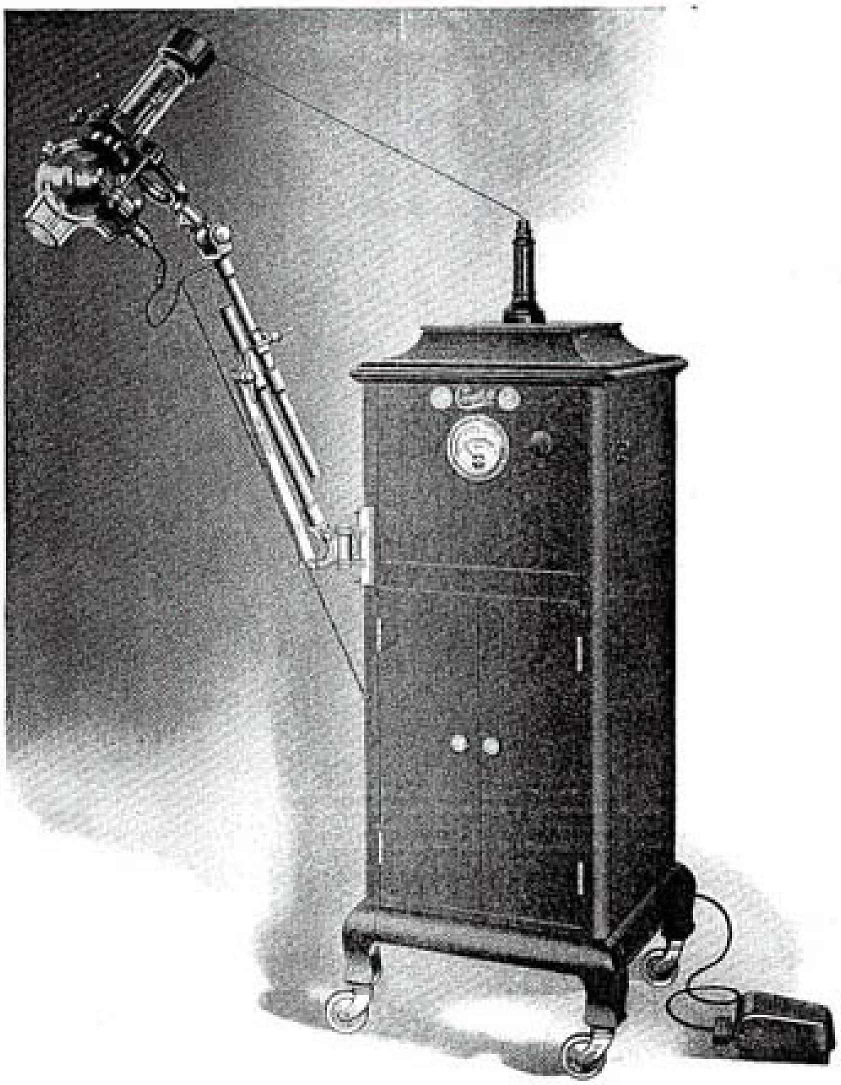
stereoscopic shift
chine to patient.
olume is sufficient
. S. Army Manual

not be done with
of sufficient pene-

uity of the dentist

leader for many
ars' experience in
tried and true.

Campbell Coolidge
DENTAL X RAY
UNIT



CAMPBELL COOLIDGE — DENTAL X-RAY UNIT

Cat. No. 1200

U. S. Patents
December 19, 1911; April 22, 1913; August 7, 1917.
Other Patents Pending.

Campbell Coolidge
DENTAL X-RAY
UNIT

Patented

Campbell Coolidge Dental X-ray Unit

Silent—Always ready without preliminary adjustments—Uniform Results

Dentists realize now the necessity of X-ray in their practice. The patients also are beginning to realize its importance.

Many dentists have neglected to avail themselves of this powerful aid to their profession, due in many cases to the fear that X-ray work would be too difficult.

In the Campbell Coolidge Dental Unit the process of making dental radiographs has been reduced to one of extreme simplicity as it is only necessary, after film and tube are placed, to close switch for a few seconds and film is ready to develop.

This simplicity in operation is obtained, due to the fact that the current in the tube remains practically constant as to volume and voltage, thus the operation can be repeated hundreds of times with uniform results, and without the annoyance of the noise and adjustments of spark gaps, tube vacuum, etc.

The whole outfit is the evolution of many years of combined research work and is a model of **efficiency, beauty,** and **durability,** such only as this company of twenty years' experience in the manufacture of all kinds of X-ray apparatus for the dentist, physician and hospital will offer to the dental profession.

SPECIFICATIONS.

Cabinet—Equipped with ball-bearing casters. Mahogany is the standard finish. Other finishes are special.

Milliammeter—Mounted flush in front of cabinet. Indicates current passing through tube.

High Tension Transformer—Secondary 45,000 volt. Closed core, oil insulation, metal tank. Cathode terminal grounded, minimizes danger of accidental shock.

Auto Transformer—Compensates for difference in line voltage, also provides filament current. Arranged so that filament current is on before high tension current is turned on.

Control—Voltage and volume are simultaneously regulated to suit current supply by turning regulator handle located on front of cabinet at right of milliammeter. This method of control compensates for rise and fall in voltage and consequent fluctuation of penetrative value of the X-rays which results in apparatus regulated by control of filament circuit only.

Reels—for connecting wires—Self-winding, concealed in cabinet.

Foot Switch—Carbon contacts prevent sudden inrush of current to transformer and prevent arcing and burning of contacts.

Current Required—Operates on alternating current of from 100 to 120 volts, 40 to 60 cycles, 10 amperes. Also on direct current by addition of rotary converter mounted in bottom of cabinet.

Tube Holder—Universal adjustment to any position. Rigid, highly finished.

Protection—The standard and approved Coolidge special heavy glass tube shield completely enclosing tube. Made of lead glass equivalent in protection to approximately 1/32" metallic lead.

Tube—Self-rectifying Coolidge radiator type, designed with special reference to convenience of focusing in dental work. Cathode terminal placed at right angles to anode allows rays to emanate from end of tube opposite anode, thus eliminating much of the inconvenience usually attendant to getting patient and tube in proper position for radiograph.

Patents—This apparatus is protected by U. S. patents issued Dec. 19, 1911, April 22, 1913 and August 7, 1917. Other patents pending.

OUTFIT.

Coil—A. C., 110 volt, 60 cycles, including mahogany finished cabinet, transformers, regulators, meter, etc. Catalogue Number 1200

Tube Holder—Universal Bracket Type. Catalogue Number 2007

Foot Switch—Carbon make and break. Catalogue Number 1037

Glass Shield—Lead protective. Catalogue Number 2010

Coolidge Tube—Dental Radiator type. Catalogue Number 1029

ıit

m Results

also are be-

ir profession,

phs has been
ıre placed, to

tube remains
ted hundreds
ıents of spark

ıd is a model
years' expe-
and hospital

inish. Other

through tube.
ılation, metal

ides filament
ırned on.
pply by turn-
ıod of control
value of the

nsformer and

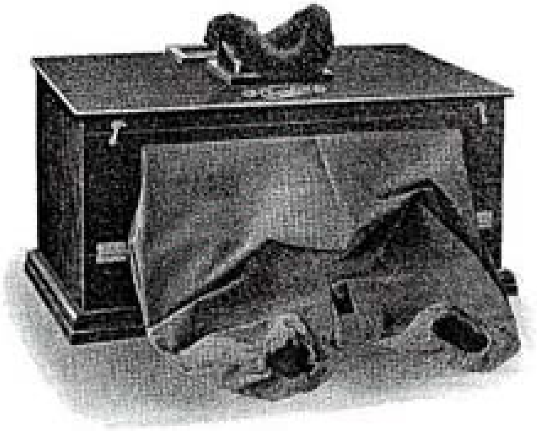
ılts, 40 to 60
ted in bottom

ıd.
ıld completely
metallic lead.
o convenience
s rays to ema-
ce usually at-

April 22, 1913

formers, regu-

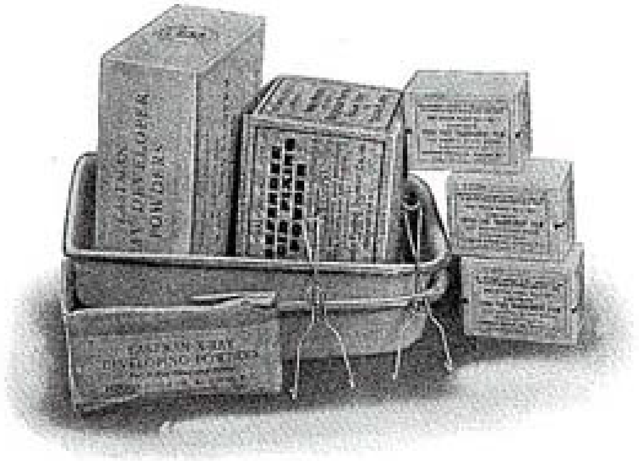
Campbell



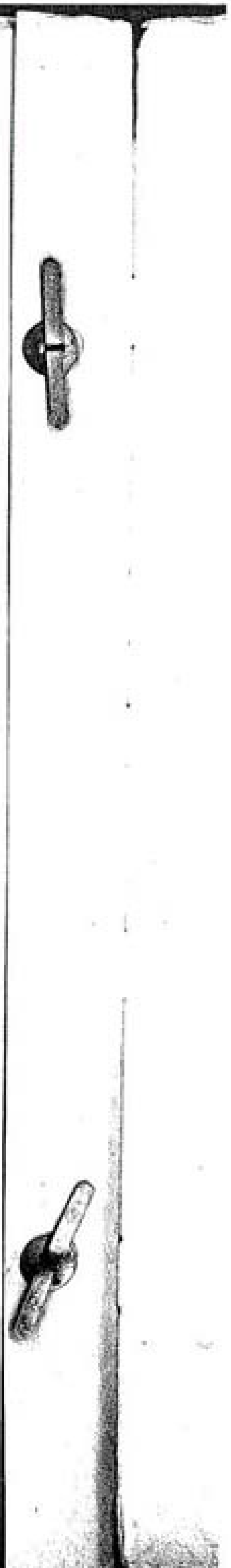
Campbell Developing Cabinet

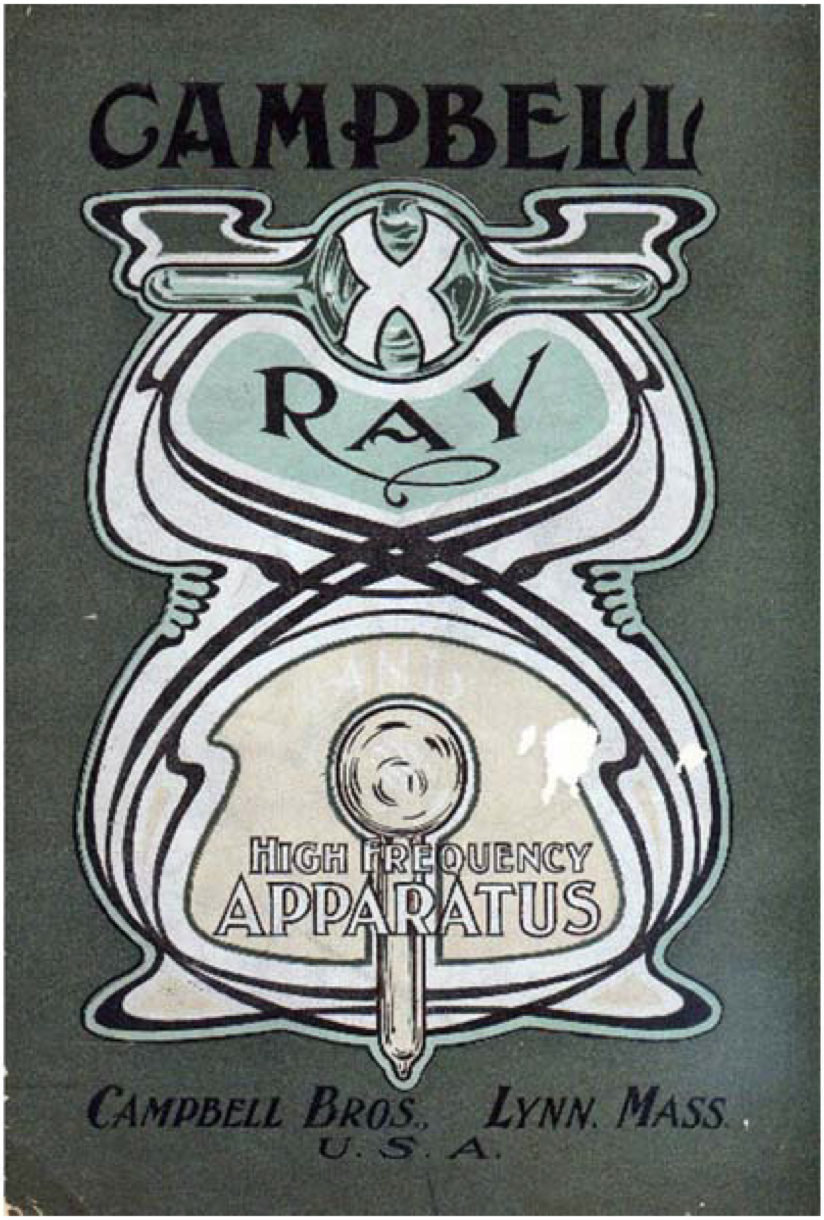
Cat. No. 2047

Developing Cabinet—a great convenience where a dark room is not available. Designed especially for developing and fixing dental films and small plates. Armlets are held tight around the arms by elastic which excludes all light. Front of cabinet opens full length to allow placing of trays or cups containing developer, fixer and water. Operator views process of development through opening at top, which is covered by ruby glass. When film or plate is developed, it may be examined by film illuminator, consisting of opal glass set in top of cabinet, under which is incandescent light which throws light into the cabinet through a ruby glass for development, and through the opal glass for examining the finished film. Mahogany and Oak are standard finishes, all other finishes are special. Furnished with two 5 x 7 trays, developing, fixing powders, film clips and three dozen No. 1 films.



Supplies furnished with cabinet

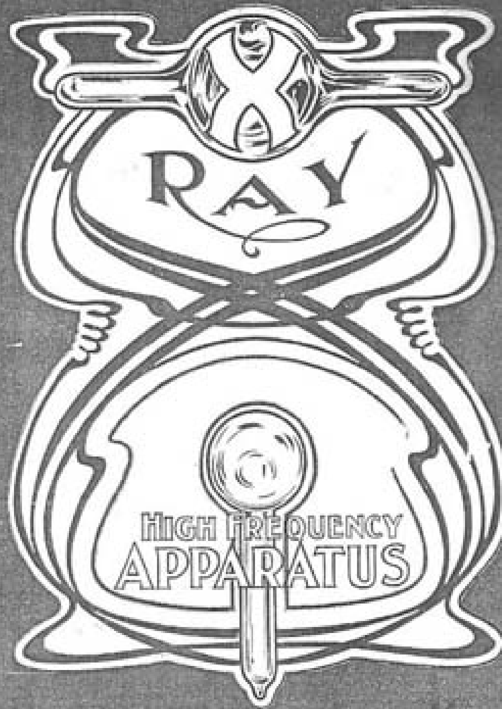




CAMPBELL X RAY AND HIGH FREQUENCY APPARATUS

CAMPBELL BROS., LYNN. MASS.
U. S. A.

CAMPBELL



HIGH FREQUENCY APPARATUS

[illegible] LYNN, MASS.

No. 24a

Campbell X-Ray

...and...

High Frequency Apparatus

7-24

Boston Office:

No. 8 Cumberland St.,
Cor. Huntington Ave.,

Dr. Mayberry.
Tel. 21746 Back Bay

Campbell Bros.,

Manufacturers,

Electrical Apparatus,

Lynn, . . Mass., U.S.A.

Campbell Combination Cabinet and Portable Coil.

⚜ Introduction ⚜

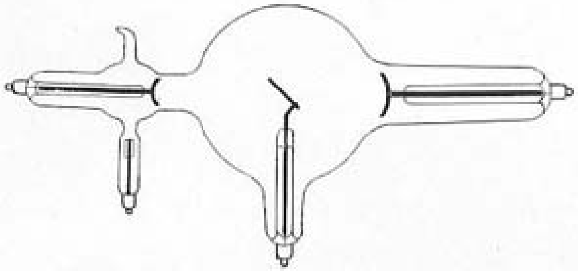
> "Though exaggerated optimism should be warned against, still it seems to me the time has arrived when we must lay aside doubts, fears and prejudices and realize that we are entering upon an entirely new era in the science of medicine, whose horizon grows brighter the more we strive to penetrate it."—C. W. ALLEN.

The day has passed when it is necessary to advance any argument as to the value of the Roentgen Ray, either as a diagnostic or therapeutic agent. The opinion of physicians of experience is practically unanimous as to its value in all forms of Chronic Skin Diseases, including Epithelioma, Scrofula, Lupus, Rodent Ulcer, Sycosis, Acne, Psoriasis, Chronic Ulcers and Pruritis. In Carcinoma and Sarcoma, the results have been very encouraging, the pain, odor and discharge subsiding in almost every case, and a number of permanent cures have been reported. The fear of an X-Ray burn has deterred many from using this method, but while the danger is a real one, it has been much exaggerated, and with proper care need never occur. Williams estimates it at not more than *one in five thousand.*

The high frequency current is preferred as a therapeutic agent by all the French, German and English, as well as many American writers on the subject, to any other form of electrical treatment.

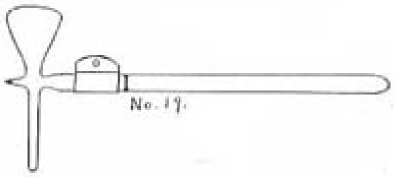
The D'Arsonval current has produced remarkable results in the class of diseases characterized by Defective Assimilation—and Metabolism, Gout, Rheumatism, Diabetes, Tubercolosis, Obesity, Anemia, Neurasthenia, Etc.

Lynn, Mass., July, 1905.

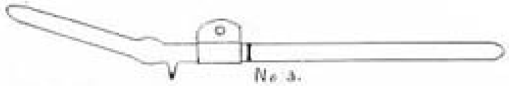


X-Ray Tube Furnished with Complete Outfit.

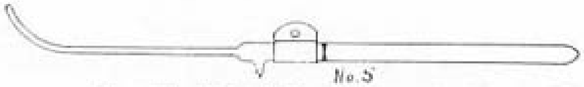
This Tube has been especially designed for use with High Frequency Currents and does not turn black under severe use.



No. 19.

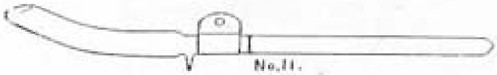


No. 3.

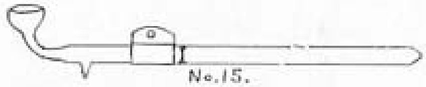


No. 5

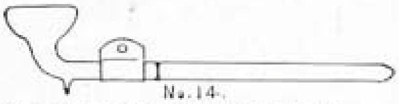
Above with Handle, Each $1.50. Without Handle, Each 75c.



No. 11.

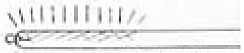


No. 15.

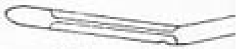


No. 14.

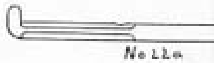
Above with Handle, Each $1.50. Without Handle, Each 75c.



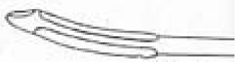
No 25.



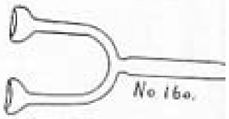
No 23a.



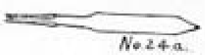
No 22a



No. 21a.



No 16a.



No 24a.

VACUUM ELECTRODES.

No. 3—Rectal		No. 19—Hammer	
No. 5—Curved Urethal		No. 21a—Cervical	$1.50
No. 11—Vaginal		No. 22a—Post Nasal	1.50
No. 14—Surface		No. 23a—Rectal	1.50
No. 15—Single Eye		No. 24a—Aural	1.50
No. 16a—Double Eye	$ .75	No. 25—Filled with Phosphorescent Mineral	2.00

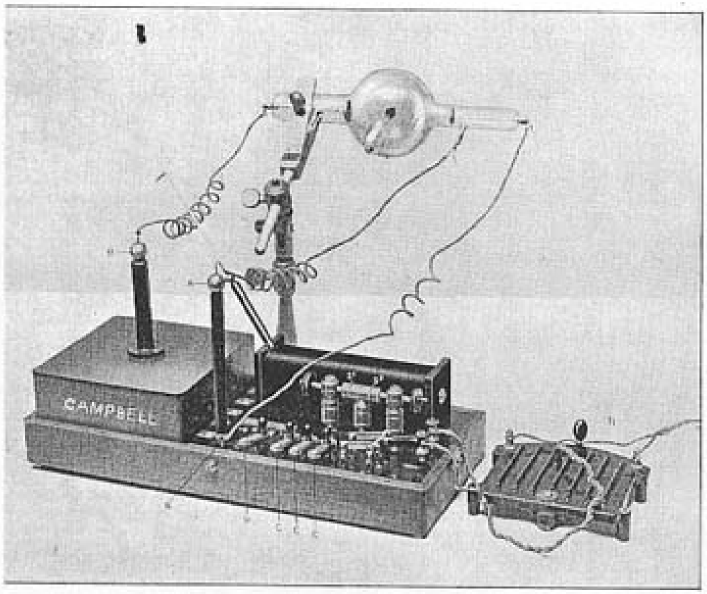
CAMPBELL X-Ray and High Frequency apparatus is now in use by the leading physicians and hospitals throughout the United States, and is also in extensive use in foreign countries. This apparatus is universally conceded to be the most practical and efficient that has ever been placed on the market by any manufacturer.

Although a large proportion of the physicians using this Coil were unfamiliar with the management of apparatus of this kind, in no case has there been any difficulty in operating the Coil, or adverse criticism of its efficiency, either electrically or therapeutically. We believe this to be a record unapproached by any Coil or Static Machine now in use. The use of Coils of the High Frequency type is comparatively new as a generator of the X-Ray, but on account of its Simplicity, Economy and Reliability it is rapidly coming to the front.

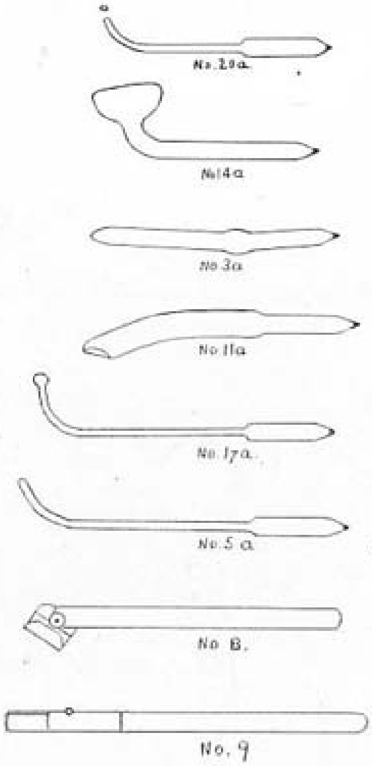
Dr. Walter White says of this type of Coil: "It is useful not only in producing High Frequency currents for Therapeutic uses, but is well adapted for producing currents which are used in the production of the X-Ray. It is only recently that the High Frequency apparatus has come forward as an X-Ray machine, this field having been almost entirely monopolized by the Induction Coil, and to a lesser extent by the Static Machine. * * * Where the Alternating current is in use, however, the High Frequency apparatus gives at once a most powerful, as well as a very simple means of generating currents for X-Ray work. It is when operating with the Alternating current that the High Frequency Coil is shown at its best as a producer of the Roentgen Ray."

The advantages possessed by the High Frequency Coil over the Induction or Ruhmkoff Coil are: Simplicity (both in Construction and Operation), less tendency to break down, no Interrupter is required. The Interrupter has yet to be invented that does not require constant attention. Steadiness of light, less noise in operating and the fact that both the X-Ray and High Frequency effects may be obtained *without the addition of any other piece of apparatus* [The *Induction* Coil requires a Resonator to give the High Frequency effect, and if an Alternating current is used, a motor Generator is also necessary to give good results].

The Static Machine is more expensive, more troublesome, does not operate well in damp weather, requires an expensive motor that consumes several times the current required to operate the Coil, needs frequent cleaning, adjusting and general overhauling to keep it in operating condition, takes up more room and is inferior to the Coil in X-Ray work.



Campbell Portable Coil--Ready for Use



No. 20a.

No 14a

No 3a

No 11a

No. 17a.

No. 5 a.

No B.

No. 9

Set of Vacuum Electrodes

Furnished with complete outfit. The above set of High Frequency Electrodes comprises all sizes and shapes necessary for ordinary use. Special Electrodes furnished at lowest prices.

THE Campbell High Frequency Coil is designed to operate on any current, but when the direct current is in use it is necessary to add a Rotary Converter to the equipment. As the Alternating current is in almost universal use, it is a simple matter to connect it up ready for operating. No Interrupter, Motor, or other apparatus, except a Rheostat to regulate the amount of current, is required. In ordering, always state the kind of current in use, the voltage and, if Alternating, the number of cycles.

To meet the demand for a more elaborate and imposing piece of apparatus, we have designed a Coil in cabinet form. It is made of quartered oak, beautifully finished, and makes a very attractive piece of office furniture. The Coil is so arranged that it can be removed from the cabinet, thus retaining the portable feature. In addition to four drawers for Electrodes, Etc., there is a rack for holding two X-Ray tubes and room for the Fluroscope.

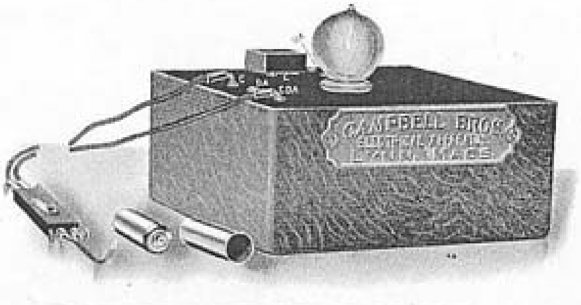
The prices are strictly net cash and under no consideration will any discount be given. We sell direct to the physician and at the lowest price possible for first-class apparatus. While the price is *less* than that of other manufacturers of electrical apparatus of this class, it by no means follows that the Coil is cheaply made or inefficient. In fact, the workmanship *is of the best,* and the fact that we *guarantee this Coil for two years* is sufficient proof of its quality.

In offering this apparatus to the medical profession, we can state with *absolute confidence* that it is the equal is every respect, both as a generator of the X-Ray and the High Frequency current, to any of the apparatus of this type on the market. In fact, in the matter of simplicity and convenience in operating, it is *superior* to any of them.

The cost of operating is very small, not exceeding three cents per hour for X-Ray work and much less for exciting the Vacuum Electrodes.

Campbell Coil--Portable

Small case contains Coil. Large case contains Fluroscope, Tube, Electrodes, Etc.


CAMPBELL BROS.
LYNN, MASS.

Cautery and D'Arsonval Attachment.

Cautery and D'Arsonval Attachment

This attachment, shown in cut, gives the Coil a range of from 0 to 5000 milliamperes. It is interchangeable with the case containing the High Frequency Coil, and greatly increases the range of usefullness of the apparatus. With this, a current can be obtained that will very gradually and steadily heat any size Cautery Electrode to any desired degree of intensity. This current is also valuable for the operation of Diagnostic Lamps.

The D'Arsonval current may also be obtained with this attachment, and very finely regulated to any requisite strength. This is a High Frequency current of about 15000 volts that will light an incandescent lamp through the resistance of the body without producing any perceptible muscular contraction and may also be regulated at will to produce a decidedly Faradic sensation. This current is of such a peculiar nature that it has a very distinct and important field as a valuable therapeutic agent. This current may also be used to operate an Ultra Violet Lamp.

Price List

Campbell Bros., Lynn, Mass

The Portable Coil, with the necessary Cords and Plug,	$150.00
Special X-Ray Tube,	14.00
Fluroscope, with Imported Platino Bariun Cyanide Screen,	12.00
Floor Tube Stand,	10.00
Set of Six Vacuum Electrodes,	5.00
Rheostat,	9.00
	$200.00

The Coil in Cabinet, with Cords and Plugs,	$200.00
Special X-Ray Tube,	14 00
Tube Stand,	10.00
Fluroscope,	12.00
Vacuum Electrodes,	5.00
Rheostat,	9.00
	$250.00

[If cash accompanies the order, we will give an extra $14.00 X-Ray Tube with this outfit.]

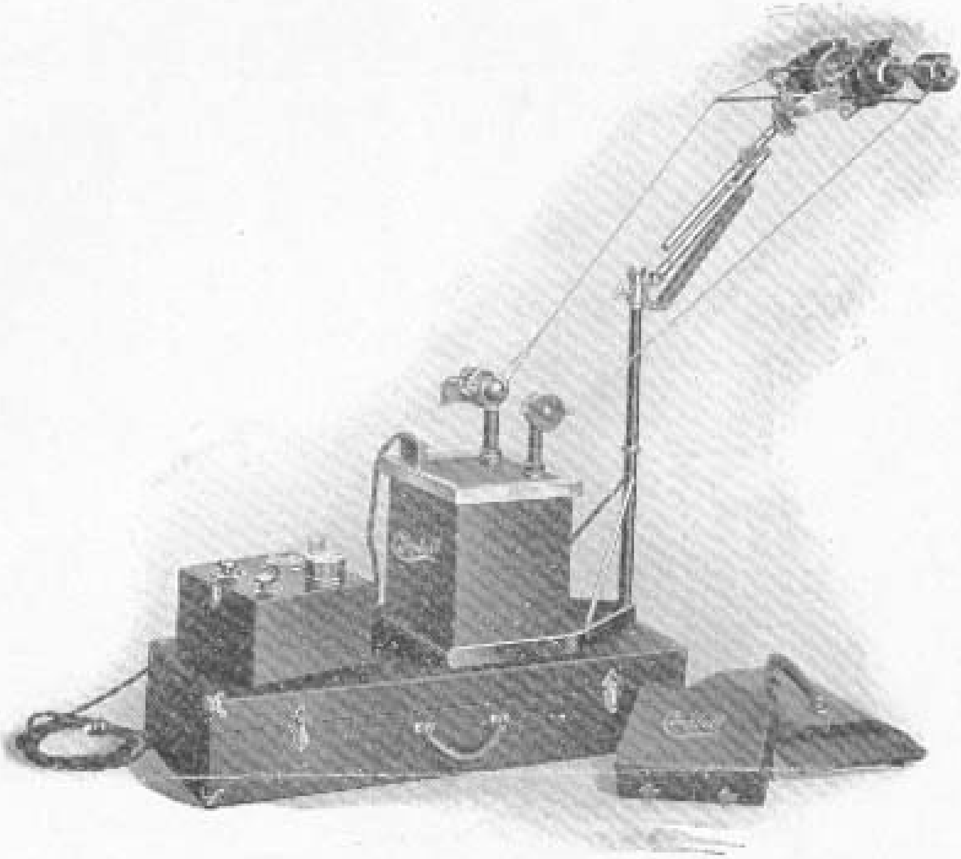
The Complete Portable Outfit, including case containing X-Ray Tube, Rheostat, Fluroscope and Small Stand shown in Cut,	$200.00

If the Coil is to be used on direct current, add to the above prices $50.00 for a Rotary Converter.

The D'Arsonval and Cautery outfit, including the necessary Electrodes, Cords, Cautery Handle and one Cautery Electrode, $25.00.

Ultra Violet Lamp, $20.00.

Campbell Coolidge
BEDSIDE X-RAY UNIT



CAMPBELL CLINETTE X-RAY UNIT

Portable Type for Bedside Use

Manufactured by

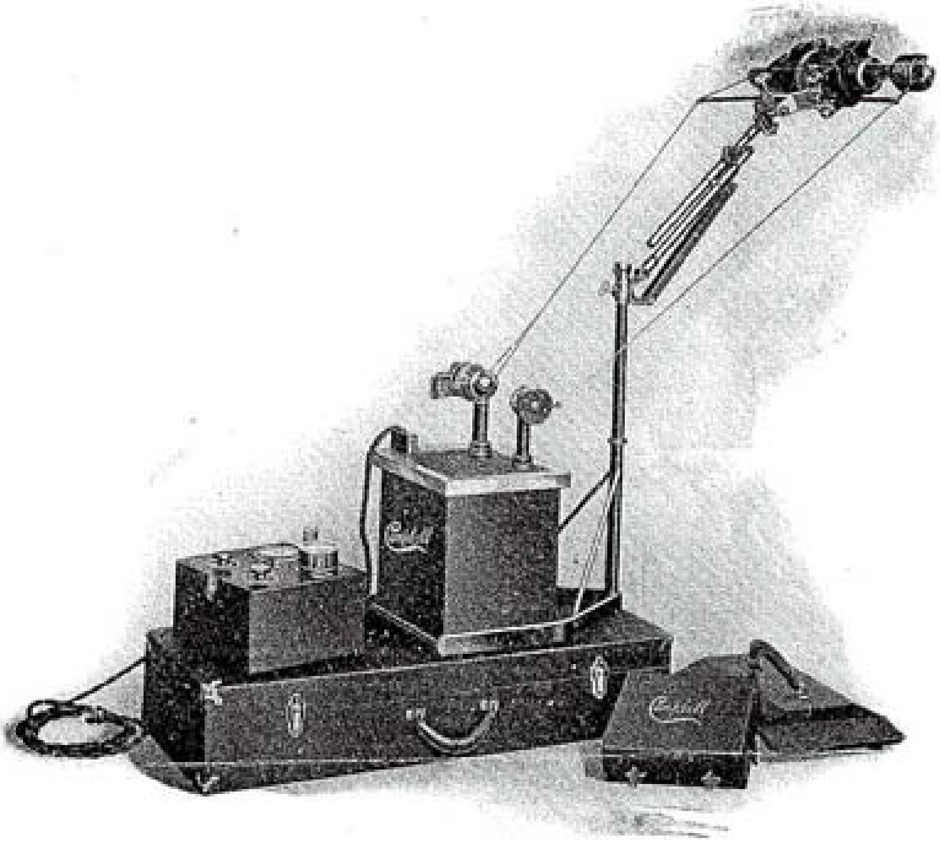
CAMPBELL ELECTRIC MFG. CO.

LYNN, MASSACHUSETTS

U. S. Patents:
Dec. 17, 1912; April 22, 1913; August 7, 1917.
Other Patents Pending.

Cat. No. 12145

Campbell Coolidge
BEDSIDE X RAY
UNIT



CAMPBELL CLINETTE X-RAY UNIT
Portable Type for Bedside Use

Manufactured by
CAMPBELL ELECTRIC MFG. CO.
LYNN, MASSACHUSETTS

U. S. Patents:
Dec. 19, 1911; April 22, 1913; August 7, 1917.
Other Patents Pending.

Cat. No. 12145

Campbell Coolidge
BEDSIDE X-RAY
UNIT

Campbell Clinette X-Ray Unit Portable Type

3 to 5-inch gap, 0 to 30 milliamperes.

Capacity: — Superb radiography of any part of the body.
Average exposure time, one second. The best of fluoroscopy.
Designed for bedside use at home of the patient.

Noted Roentgenologists using the Campbell Clinette portable unit marvel at the wonderful radiographs produced, which average much better than the work generally produced by the largest and most powerful apparatus.

Transformer may be placed on floor beside bed and tube stand raised and extended to opposite side of bed.

The whole outfit may be carried, set up ready for use, in an automobile. The exposure may be made and outfit removed all in the average time which would be required to only assemble and connect the ordinary portable outfit.

The additional capacity provided in the Campbell Clinette (0 to 30 milliamperes) over that of other portables on the market, makes it possible to do quicker and better work, also insures against failure in those occasional, but so important, very difficult cases, only one of which either directly or indirectly might be worth the cost of the entire outfit. When desired, only ten milliamperes may be used or by simple adjustment of the regulators, various combinations between 0 to 30 milliamperes and 3 to 5-inch gap may readily be obtained. Sufficient capacity to radiograph or fluoroscope any part of the body.

One of the principal advantages of this apparatus, which is fully covered by U. S. Patents is that by slight adjustment of the voltage and current regulators the current may be changed to various volume at a 3, 4 or 5-inch gap in ¼" steps, always maintaining the selected voltage at the tube terminals regardless of the load, which is so necessary in order to establish the exposure technique which in results marks the difference between the expert Roentgenologist and the one who is rated as of mediocre attainment. For instance, five, ten, or twenty milliamperes may be obtained at *either* a three, four or five-inch gap.

This equipment in connection with Eastman Dupli-Tized films and double intensifying screens, one on either side of the film, will produce wonderfully rapid work. For Dental and the majority of other work, no screen is needed.

The whole outfit is the evolution of many years of combined research work, and is a model of efficiency, beauty and durability such only as this company of twenty-years' experience in the manufacture of all kinds of X-Ray apparatus for the physician, dentist and hospital will offer to the profession.

SPECIFICATION

Transformer A. C. 110 volt, 60 Cycle, including self-winding cord reels, filament, posts, handle, cover, connecting cords, etc., Cat. No. 12140, including carrying case, Cat. No. 12142.

Control. Separate Auto Transformer Control with instruments, connecting cord, rheostat, etc., Cat. No. 12106.

Tube Holder. Adjustable bracket, portable type, with base frame, extension rod, tube clamps, cord spreaders, etc., Cat. No. 12141.

Foot Switch. Enclosed type, Cat. No. 12107.

Tube Shield. Lead glass protective, bedside type, Cat. No. 12125.

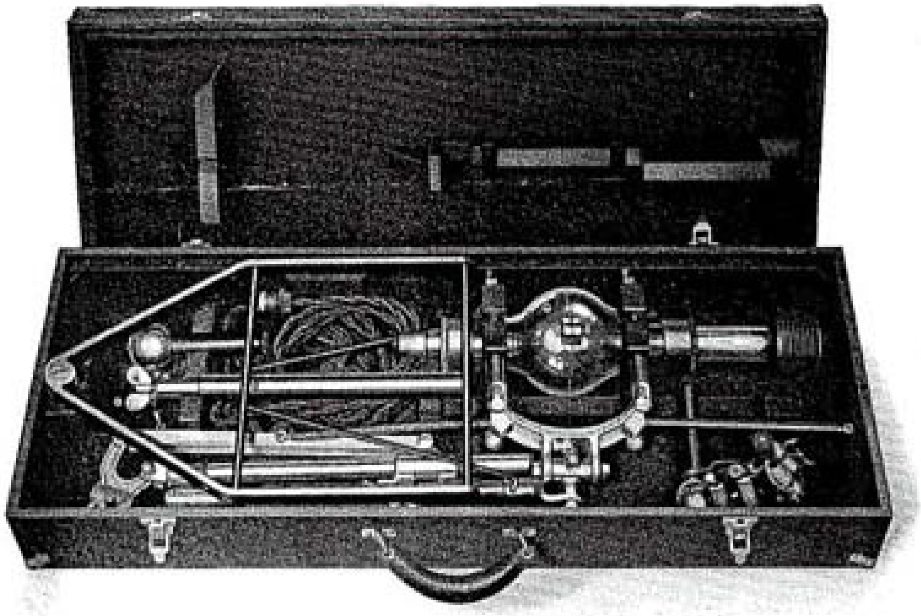
X-Ray Tube. Radiator bedside type, Cat. No. 12112.

Portable Rotary Converter for use on 110 Volt Direct Current (10 milliamperes in tube), Cat. No. 12121.

Campbell Coolidge

Campbell Clinette X-Ray Unit

PORTABLE
POWERFUL
PRACTICAL



CLINETTE
CARRYING
CASE
PACKED

Campbell
Campbell

CAMPBELL
CLINETTE
COIL
CONTROL
AND
CARRYING
CASE
PORTABLE

Form Clinet 15M-7-1
Campbell Electric Manufacturing Company
Lynn, Massachusetts

Campbell
ELECTRIC CO.
LYNN, MASS.

Essentials To Successful Roentgenology

See that films are loaded and developed in an absolutely light-proof room, by a safe ruby light. Without screens, for better detail of soft parts, multiply the following screen exposures by 5.

Dense black films or dark gray all over, indicate over exposure or over penetration.

Light, thin, transparent films indicate under exposure or under penetration.

Films showing rich black and white detail are produced by using the lowest spark gap which will provide sufficient penetration for the part to be radiographed — good light-proof dark room — safe ruby light — fresh unexposed films — fresh cool developer and fixer and washing for at least twenty minutes in cool clean water. Cones, diaphragms, proper angles and immobility of subject also contribute to the making of good radiographs.

In placing film under patient, have center of target of tube opposite center of film, with part to be radiographed directly in path of the central ray. In using double intensifying screens, place film between the screens (in dark room) in light tight cassette or other exposure holder, coated sides of screens toward film.

Note: — *Unexposed films must be kept in properly constructed lead-lined box, heavy iron safe or other X-Ray proof protector which is absolutely certain to be closed during excitation of the X-Ray tube if only for one brief moment, as one flash of X-Ray could completely ruin a whole stock of sensitive films.*

Exposure Scale for use with Campbell Clinix, Clinical, Clinette and Portex X-Ray Units.
Based on 150 lb. normal weight. Develop 5 minutes at 65 degrees F.

Part	Tube Distance Target to Film	Spark Gap Inches	Exposure Time Seconds			Intensifying Screens	Film	Special
			Milliamperes					
			10	20	30			
Fingers, Toes	20	3	2	1	⅝	None	Dupli-tized	
Teeth	20	4	4	2	1½	None	Dental (Fast)	
Hand	20	3	4	2	1½	None	Dupli-tized	
Wrist	20	3	4	2	1½	None	Dupli-tized	
Ankle	20	4	3	1½	1	None	Dupli-tized	
Chest	28	4	1½	¾	½	Double	Dupli-tized	
Tibia, Fibula	20	4	4	2	1½	None	Dupli-tized	
Elbow	20	4	5½	2¾	2	None	Dupli-tized	
Knee	20	4	1½	¾	½	Double	Dupli-tized	
Shoulder	20	4	1½	¾	½	Double	Dupli-tized	
Gastro-Intestinal	26	5	2	1	¾	Double	Dupli-tized	B. S. Meal
Cervical Spine	20	4	2	1	¾	Double	Dupli-tized	
Head (lateral)	20	4	4	2	1½	Double	Dupli-tized	
Kidney, Gall-Bladder		4	4	2	1½	Double	Dupli-tized	Compression
Hip, Pelvis Lumbar Spine	20	4	5½	2¾	2	Double	Dupli-tized	
Lateral Spine	28	5	8	4	3	Double	Dupli-tized	
Head (posterior-anterior)	20	5	5½	3	2	Double	Dupli-tized	Angle

The 20 Milliampere Technique has proven most uniformly satisfactory.
Secondary radiation is comparatively slight and radiographs consequently clear.

Fluoroscopy — This work is done with a current of 3 to 5 milliamperes with a penetration equivalent to a 3" to 5" spark gap according to part and condition to be studied. The room must be absolutely dark. The light from the filament of Coolidge tube must be excluded. One should remain in the darkened room for at least 15 minutes for sensitizing the retina before attempting to make fluoroscopic examination, otherwise the object to be examined may not even be visible. If any light must be used temporarily, it should be a dim ruby light. A sensitive fluoroscopic screen should be used with proper lead glass, sheet lead or other protection. In this, as in all X-Ray work, the greatest care should be used against over exposure of patient, operator or attendants, as well as persons in adjoining rooms.

CAMPBELL ELECTRIC MFG. CO.
LYNN, MASSACHUSETTS

Model "E" Coil

3797

Campbell
Electric Co.
Lynn, Mass.

X-Ray and High Frequency Apparatus

Campbell Electric Co.
Lynn, Massachusetts, U. S. A.

Campbell

THE CAMPBELL X-RAY AND HIGH FREQUENCY APPARATUS. MODEL "E"

A Coil is a Necessity to the General Practitioner

It is no longer necessary to spend time convincing the general practitioner that some form of electrical apparatus is as essential to his office equipment as the automobile is to his practice outside the office. It only remains to point out the special requirements of the apparatus best suited to his needs which with the minimum outlay will produce the maximum of efficiency and the widest range of usefulness.

Advantage of Portability combined with Appearance of Permanency

Not all the cases which the doctor wishes to treat with electricity nor all the cases which he wishes to diagnose by the X-Ray are able to come to his office, therefore some form of portable apparatus is desirable which may be used in any place where ordinary lighting current is available and which may be quickly attached to an ordinary lamp socket. On the other hand he wants something which in his office presents an attractive appearance and which resembles a piece of permanent furniture rather than an over grown battery.

The Campbell the Pioneer

Growth and Evolution of the High-Frequency Coil

THE CAMPBELL ELECTRIC COMPANY was the first to recognize these needs of the physician for something which should provide him with a simple yet efficient Coil adapted to a variety of uses for general forms of electrical treatment and at the same time adequate to meet the demands for radiographic and radiotherapeutic work. The pioneer among portable coils,—"THE STANDARD",—was given to the profession some eight years ago and at once met with popular favor. Later several currents were added to this coil, a number of improvements in construction adopted and our Model "D" was a worthy successor to our earlier production and was as enthusiasitcally received as its predecessor. From the first we have been studying constantly the possibilities of improvement in construction and addition to the usefulness of our coil until we are able to present our Model "E" as the most perfect and complete piece of High Frequency apparatus yet offered to the profession.

THE CAMPBELL MODEL "E"

The Model E Coil First as to its general appearance and construction. The coil itself with all its working parts is contained in a handsomely finished quartered oak case 22 inches long by 10 inches wide by 8 inches high. It is fitted with a hinged cover which contains receptacles for tube-stand, electrodes and handle, cautery, diagnostic lamp, posts, cords and all accessories with the exception of the X-Ray tube. The entire cover and contents can be instantly separated from the coil which when placed in the cabinet designed for it, loses all appearance of portability and becomes a handsome piece of office furniture.

The Cabinet The cabinet is also constructed of handsomely polished quartered oak, panelled and fitted with polished nickle trimmings. The top is recessed to contain the coil, it has two drawers for cords, and other small articles, a rack to hold a set of six electrodes and handle, protected by a glass door, and a compartment with a rack for holding two X-Ray tubes and a fluoroscope. It is provided with casters and is easily movable. Its dimensions are, height 34 inches, width 32 inches and depth 19 inches.

Construction, Operation and Uses So much for external appearance. Now as to the construction of working parts and the uses to which the coil may be put. During the past decade—as new electrical modalities have been tried and proven of value in the field of medicine, a new and separate piece of apparatus has been necessary for production of the same—until—at the present time, to obtain the currents provided by the Campbell Coil, by these separate pieces of apparatus, would require at a conservative estimate an outlay of no less than $350.00, to say nothing of the space occupied and complication of operation and maintainance.

The Campbell Model "E" Coil combines in one compact sensible and elegant piece of apparatus at a cost of only $180.00 all that could otherwise be produced at an investment of from $350.00 up.

Description of Working Parts

Its operation is entirely controlled by two switches and a spark-gap. The switches are of positive snap contact, equipped with ball bearings, move clockwise from left to right, are mounted on a specially insulated base of which we have exclusive control and are provided with plainly marked dials and pointers which clearly indicate the character and volume of the current. The various connections are also clearly marked by black and silver name plates. Of the two switches the one at the left has four points and controls frequency of current while that at the right has seven points and regulates volume. By combination of switches and spark-gap all varieties of frequency and volume may be accurately obtained from the most delicate current of extreme high frequency for use about the sensitive parts of the body up to a heavy X-Ray current of relatively slow condensation and extreme volume.

Protective Devices Protection to coil, patient and operator are afforded by a number of safety devices.

Pilot Light A pilot light serves the double purpose as an indicator when current is entering the primary and also provides sufficient illumination for manipulation of switches when the coil is used in a darkened room.

Protected Spark-Gap With an exposed spark-gap a dangerous current may be received by accidently touching same when coil is working with full condenser capacity, therefore in Model "D" we adopted the Protected Spark Gap.

Removable Spark-Gap In our Model "E" we have gone still further, not only safeguarding against possible accidental contact but have also made the spark-gap easily removable for the purpose of cleaning or renewing contact faces.

CAPACITY OF COIL AND CURRENTS OBTAINABLE

Factory Test All coils are thoroughly tested before leaving the factory by means of accurate meters and are subjected to a breakdown test beyond the point at which they are to be operated in regular service. When operated at full capacity Model "E" coil delivers a greater volume of current than is necessary for any practitioner in radiographic work.

CURRENTS

High Frequency The High Frequency current of Model "E" varies in volume and frequency from a vacuum electrode current of such mildness and rapidity of alternation that the only sensation produced by it is that of grateful warmth, and which may be painlessly used in the cavities of the body and upon the most sensitive surface, up to one of sufficient volume and of sufficiently slow condensation to satisfactorily excite a heavy X-Ray tube of high resistance, producing X-Rays of enough volume and penetration for deep radiographic work.

Sinusoidal The Sinusoidal is an alternating current of varying potential which is used by means of metal electrodes and which produces a variation of stimulating effects with a wide range of strength according to regulation of switch.

Thermo-Faradic The Thermo-Faradic is so named from the fact that it produces the sensation of a very fine Faradic current together with a sensation of decided heat. It is a true high frequency current and therefore can be applied in large volume and at a voltage varying from one to four thousand. It may be applied by metal or moist electrodes and when so used combines the advantages of heat, moisture and electricity. This current may also be used in connection with the Auto-Pad producing a current of equal measurement with the so called D'Arsonval of coils of other makes.

D'Arsonval The D'Arsonval current from our coil is true to its name and is similar to the Thermo-Faradic but of greater volume and voltage (up to 15,000 volts.) It can be regulated so that it will not cause any effect on the sensory nerves, or so that it will produce an energetic vasomotor constriction and is used in connection with the Auto-Pad not only for general effect but is of extreme value in reducing arterial tension.

Cautery The electric cautery current produced by the CAMPBELL is the superior of that of many cautery-transformers which are sold at a price ranging up to fifty dollars and makes a most useful adjunct to the office equipment of the doctor, whether specialist or general practitioner.

X-Ray From the beginning our coil has been the leader among High-Frequency coils in the production of X-Rays and in the hands of our customers it has done all classes of radiographic work up to and including radiographs of the hip in stout subjects, and that most difficult of all radiographic work,—the location of renal calculi. From the ease with which volume of current and frequency can be controlled, it is the ideal coil for radio-therapy.

Diagnostic Lamp To our latest model has been added a special connection for the attachment of a diagnostic lamp. This connection is on an independent circuit and has a controlling rheostat of its own. We furnish with each coil a diagnostic lamp fitted with reflector guard and tongue depressor. The convenience of this feature will appeal to every physician without further comment.

Tube Stand A small tube stand, the exact counterpart of the floor tube stand, has been provided. It fastens rigidly to the case of the coil, is capable of all adjustments and when not in use takes down and occupies but small space in the cover of the coil.

Carrying Case We also manufacture a carrying case of new design which is amply large to contain tube, electrodes, fluoroscope, cords, plates and other accessories. Special boxes designed for the protection of tube and electrodes are furnished with each tube or set of electrodes and the carrying case has been constructed with special reference to holding these boxes.

Taken as a whole Model "E" is built like a watch—not the pocket clock of the dollar variety but a high-grade twenty-one jewel movement. It combines delicacy, efficiency and durability and whether packed for portable work or in the office as a piece of permanent furniture it has no equal for beauty, mechanical perfection, ease of comprehension and manipulation, variety and efficiency of currents produced, which will in all cases be found true to the name applied and of ample volume for all uses to which they are to be applied.

Prices as hereinafter quoted are net and include careful packing and crating F. O. B. Lynn.

GUARANTEE

We guarantee our Coil against any inherent defect for a period of two years and will during that time repair free of charge any injury received by it from its own operation. We place a limit of two years on the guarantee but as a matter of fact it has been our custom in the past to make good any coil that we have ever built which has become injured by any cause other than entirely outside agency.

Campbell

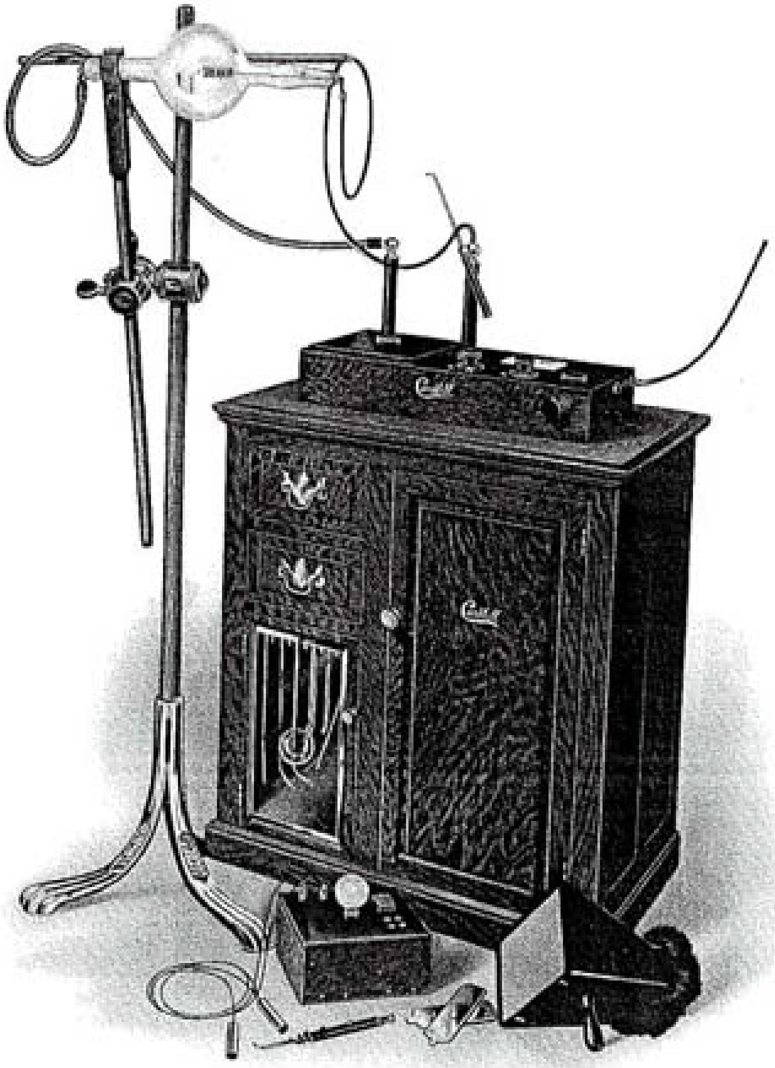
PRICE LIST

Coil complete including cords, metal electrodes, cautery handle with cords and one point, diagnostic lamp with cords and attachments and portable tube stand	$180.00
Set of six vacuum electrodes with universal handle	5.00
Floor tube stand	10.00
X-Ray tube (heavy anode) 6 inch diameter	18.00
Fluoroscope	12.00
Cabinet	30.00
No. 6 Outfit, including all in above list	255.00
No. 5 Outfit including all in above list, except cabinet	225.00
Carrying case	5.00
Rotary Converter (necessary only for use on direct current)	35.00

ACCESSORIES SEPARATELY

Heavy cable with swivel attachment	$1.50
Steel tapes, each	.75
Light cord with swivel attachment	.50
Cords for metal electrodes per pair	.75
Cautery outfit complete	1.75
Diagnostic lamp outfit complete	3.50
Replacing diagnostic lamp	.25
Replacing Pilot lamp	.25
Metal hand electrodes (without cords) per pair	.30
Moist electrodes (without cord)	.75
Improved Universal handle for vacuum electrodes	.75
Vacuum Electrodes, ordinary to fit universal handle, each	.75
Vacuum Electrodes Insulated, each	1.50
Auto Pad	10.00
Tube Shield	8.00

4415 Uber Set
Dr Wiggins
[illegible]



Campbell
Electric Co.
Lynn, Mass.

CAMPBELL COIL, MODEL "L"

Delivers Currents as follows:

TESLA — for Vacuum Electrodes (Violet Ray).

FULGURATION — for Desiccation.

D'ARSONVAL — for Diathermy or Auto Condensation.

This little coil delivers the highest proportionate efficiency of any high-frequency coil ever put on the market. It takes only 50 watts from the primary circuit and will deliver upward of 500 m.a. in auto condensation, which is being used by dentists for its sedative effect previous to anæsthesia. It can be operated at a cost of less than one-half cent per hour, and will run continuously for hours without overheating.

It has a regulating socket by means of which three strengths of current may be obtained. The first and second points are suitable for fulguration, and a thin cool spark may be obtained which desiccates but does not cauterize. On the second point, a soft full current is obtained for vacuum electrodes suitable for work in cavities and on sensitive surfaces. The third point is used for auto condensation.

Price Model "L" Coil only, with attachment cord and regulating socket, **$25.00.**

Note — A low voltage current for operating diagnostic lamp and cautery outfits, extra, **$10.00.**

We believe that we are safe in saying that there are more CAMPBELL X-Ray and High-Frequency outfits in use in the United States than of all other makes combined.

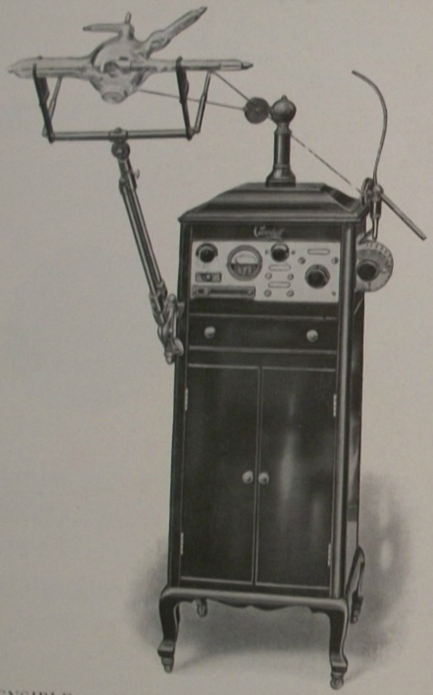
CAMPBELL COILS and Transformers are built in all sizes and types to meet the requirements of every branch of the profession from the smallest high-frequency generator to the largest complete X-Ray outfit for the most modern hospital.

Send for catalogue of complete X-Ray and High-Frequency outfits.

CAMPBELL ELECTRIC COMPANY, LYNN, MASS.

Dental Unit

X-Ray—Low Voltage Switchboard—High Frequency—Ionization



A SENSIBLE combination occupying a floor space only **eighteen inches square.** Handsomely finished to match your office furniture.

Price complete, including lead glass tungsten target X-Ray tube, adjustable tube holder, one set of High Frequency electrodes, one set switchboard instruments, and one set of ionization instruments.

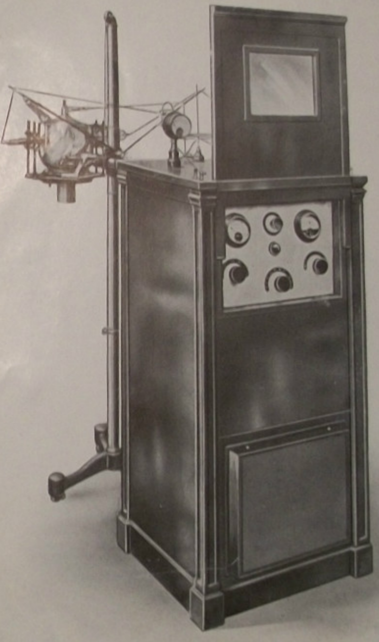
Alternating Current	**$365.00**
Direct Current	**440.00**

Without Ionization $50.00 less

Catalog, giving complete description of outfits, will be mailed on request

CAMPBELL ELECTRIC COMPANY -:- LYNN, MASSACHUSETTS

Dental SureX Interrupterless Transformer



RADIOGRAPHS on positive films in a flash. This type of apparatus is **necessary** in order to produce first-class head work. A **wonder** for speed. Occupies floor space only twenty-four inches square. Handsomely finished to match your office furniture.

SureX Dental Transformer Number one for Alternating Current, including Secondary Voltmeter, Milliammeter, Polarity Indicator, and Lead Protective Shield	**$500.00**
Number Eleven Tube Stand (counterbalanced)	**65.00**
Tungsten Target X-Ray Tube, seven-inch	**35.00**
Price, outfit complete, boxed ready for shipment	**$600.00**
For use on Direct Current	**650.00**

Campbell

X-RAY and HIGH FREQUENCY APPARATUS

PANAMA-PACIFIC INTERNATIONAL EXPOSITION SAN FRANCISCO
MEDAL OF AWARD
MCMXV

OFFICIAL
AWARD
RIBBON

PANAMA PACIFIC
INTERNATIONAL
EXPOSITION
SAN FRANCISCO
1915

PRESIDENT

PRESIDENT OF THE SUPERIOR JURY

Asher C. Baker
DIRECTOR OF EXHIBITS

SEC'Y OF THE INTERNATIONAL AWARD SYSTEM

MEDAL
—OF—
HONOR
DEPARTMENT OF
LIBERAL ARTS

Theodore Hardee
CHIEF

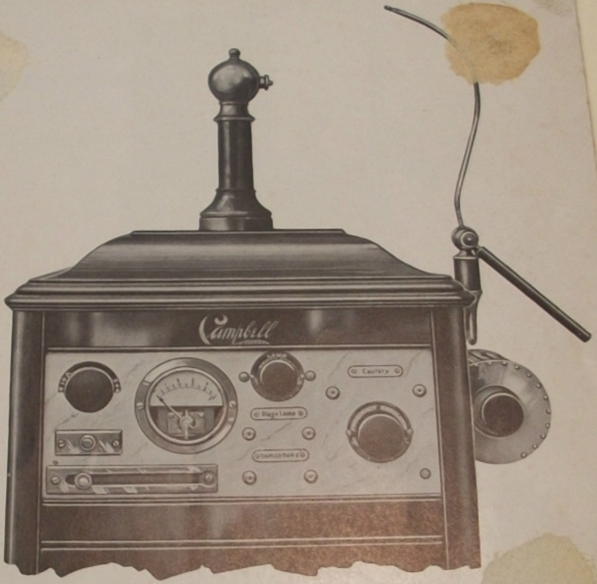
HIGHEST

AWARD

PANAMA-PACIFIC
INTERNATIONAL
EXPOSITION
SAN-FRANCISCO
1915

MEDAL OF HONOR

Ionization Apparatus



mbination with the Dental Unit 50.00

In separate case, handsomely finished to match office
size, 10″ x 10″ x 8″
For use on Direct Current . $65.00 Alternatin 75.00

CAMPBELL ELECTRIC CO

LYNN, MASSACHUSETTS

PRESS OF PERRY & ELLIOTT CO., LYNN.

Campbell
Electric Co.
Lynn, Mass.

CAMPBELL COIL

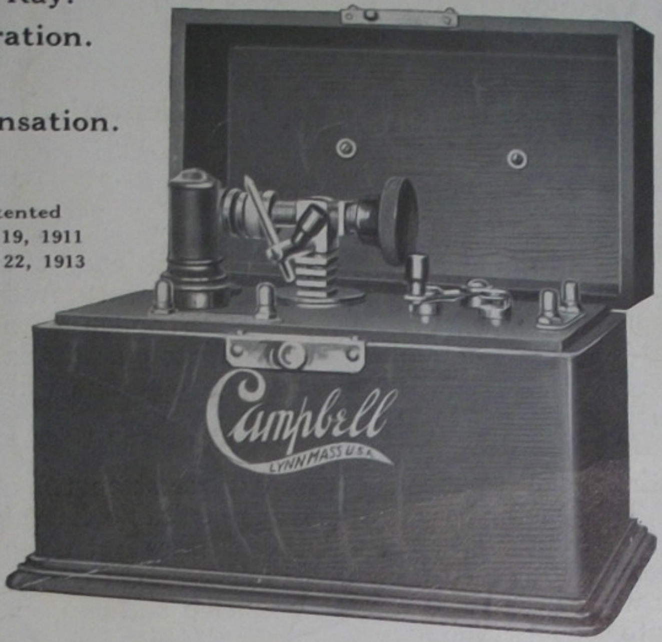
MODEL "L" HIGH FREQUENCY

DESIGNED *for* DENTISTS

Violet Ray.
Fulguration.
Auto Condensation.

Patented
Dec. 19, 1911
Apr. 22, 1913

Guaranteed for
Two Years
Against Inherent
Defect



For Detailed Description, See Other Side

OUTFIT

1 Model "L" Coil, with Regulating Socket and Attachment Cord	$25.00
1 Auto Pad, with Cords and Metal Hand Electrodes	10.00
1 Universal Handle and Cord	1.75
1 Insulated Gum Electrode	1.75
1 Insulated Cavity Electrode	1.75
1 Insulated Cataphoric Electrode	1.75
1 Insulated Pyorrhea Electrode	1.75
1 Plain Surface Electrode	.75
1 Fulguration Electrode	2.50
Outfit, complete with operating instructions, boxed ready for shipment	$47.00
Extra for Diagnostic Lamp and Cautery Current	10.00

High-Frequency Currents which have come to take so prominent a place in modern medical practice are equally applicable in dental therapeutic work.

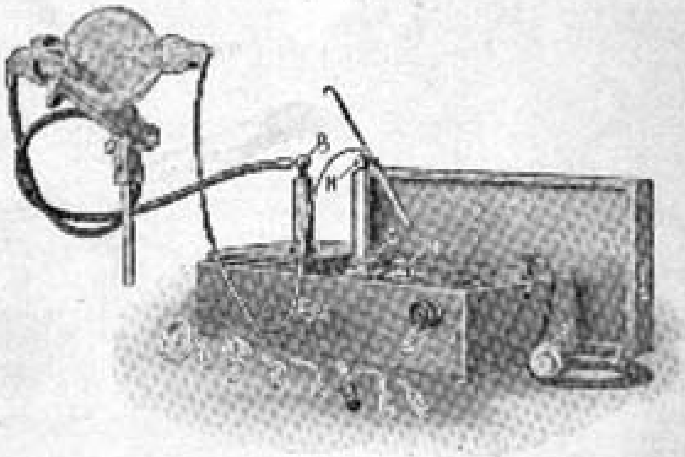
Send for Catalogue of Campbell X-Ray and High-Frequency Outfits

CAMPBELL ELECTRIC COMPANY, LYNN, MASS.

Practical Electro-Therapeutics

Campbell
Electric Co.
Lynn, Mass.

9204



CAMPBELL X-RAY AND HIGH FREQUENCY APPARATUS

Are You One of These?

[From the *British Medical Journal*.]

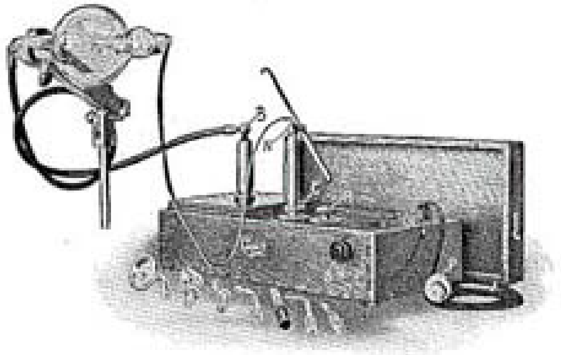
One of the worst hindrances to progress in medicine is the "superior person" who looks with suspicion and contempt on any departure from the beaten track.

Campbell Electric Company

LYNN, MASS., U. S. A.

Practical Electro-Therapeutics

Campbell Electric Co.
Lynn, Mass.



CAMPBELL X-RAY AND HIGH FREQUENCY APPARATUS

Are You One of These?

[From the *British Medical Journal*.]

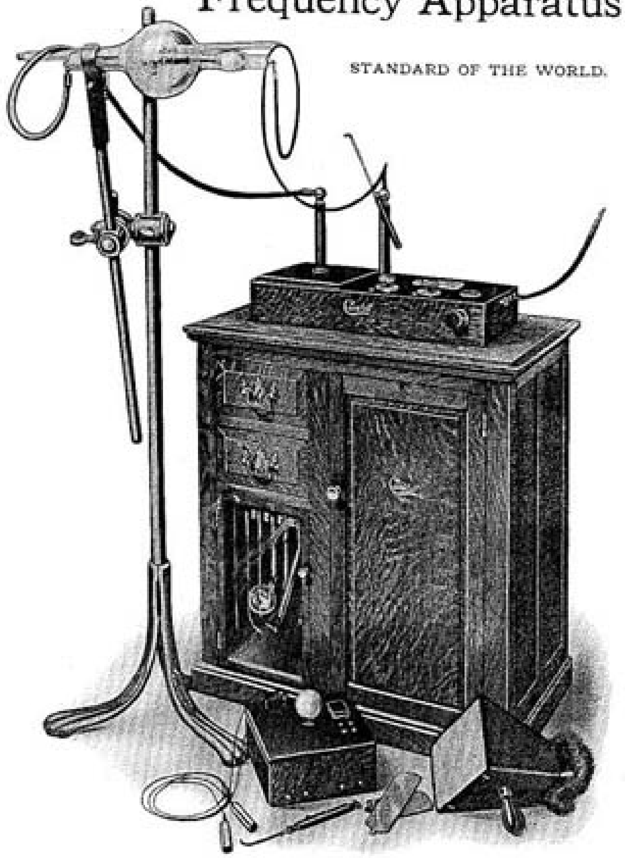
One of the worst hindrances to progress in medicine is the "superior person" who looks with suspicion and contempt on any departure from the beaten track.

Campbell Electric Company

LYNN, MASS., U. S. A.

Campbell X-Ray and High Frequency Apparatus

STANDARD OF THE WORLD.



PORTABLE
POWERFUL
PRACTICAL

Campbell Coil Model "D"
with Cabinet

EFFICIENT
MODERN
RELIABLE

AN INVESTMENT FOR INCREASED REVENUE

This Equipment gives with fine regulation seven varieties of current, therefore can be used for almost every known form of Electro-Therapeutical treatment.

PRACTICAL ELECTRO-THERAPEUTICS

CAMPBELL ELECTRIC COMPANY
MANUFACTURERS OF ELECTRICAL APPARATUS
LYNN, MASSACHUSETTS, U. S. A.

COPYRIGHTED [illegible]
BY
CAMPBELL ELECTRIC COMPANY
LYNN, MASS.
U. S. A.

Campbell

INTRODUCTION

We have prepared this book for the users of our coil, not as a complete text-book but simply as a stepping-stone to more complete investigation and study. We have attempted to give a number of suggestions that will lead to the successful employment of the various uses to which it may be put and the avoidance of certain errors which the early experience of others has demonstrated.

Work along new lines must of necessity be more or less experimental and accompanied by some undesirable results, but a large proportion of the dangers and disappointment in the use of the X-Ray have been determined and its field of work and limitations more or less clearly defined.

We have divided the subject into three heads—the use of High Frequency Currents, the therapeutic uses of the X-Ray, and the making of Radiographic Plates.

As a suggestion of the various uses which have already been made of these methods of treatment we have collected from the users of our coil and other sources a series of actual case reports which we hope may prove of value as suggestions of the possibilities of electro and radiotherapy.

For more complete treatises on the subject we would recommend:

Kassabian.	Price $4.00
Beck.—Roentgen Ray Diagnosis and Therapy.	" 4.00
Freund.—Radiotherapy.	" 5.00
Pusey and Caldwell.—The Practical Application of Roentgen Rays in Therapeutics and Diagnosis.	" 5.00
Allen.—Radiotherapy, Phototherapy, and High Frequency Currents.	" 4.50
Guilleminot.—Electricity in Medicine.	" 4.00
Crooks.—High Frequency Currents.	" 2.00
Bennett's Electro-Therapeutic Guide.	" 2.00

We hope all this will *interest* and *encourage* our *friends* and *patrons*—and *increase their number*.

Yours sincerely,

CAMPBELL ELECTRIC COMPANY.

For General Suggestions in the use of High Frequency Currents . See pages 5 to 7

Therapeutic use of the X-Ray
See pages 10 to 12

Hints for Successful Radiography
See pages 13 to 16

Campbell X-Ray and High Frequency Apparatus, Description, Complete, Prices, Value to the Physician from an Investment Point of View, etc., etc.
See our Catalogue.

"Any Disease that can be cured or relieved by the use of drugs can be cured or relieved by treatment with electricity. And more: Its effects are direct and far-reaching; it goes where drugs cannot follow."

HIGH FREQUENCY CURRENTS.

THE field of usefulness of this form of electrical treatment is so broad that it may almost be said to be unlimited. Scarcely a case comes into the office of the doctor in which it cannot be used to advantage. It has two distinct spheres of action, general and local. By its local action it will in a few minutes relieve or remove pain and soreness, local congestion and stasis. With the aid of the cataphoric electrode the application of local medication is much more rapid and satisfactory in its effects.

As to the general effect of these currents, a simple experiment will convince both physician and patient as to the far reaching distribution of their action. With the coil in operation and the bulb of the surface electrode held firmly in one hand, touch with a finger of the other hand the flesh of the patient or a gas fixture. A perceptible spark passes with a decided prickling sensation, or in the case of the finest and mildest current a sensation of slight vibration. From the fact that the skin is of high resistance it is extremely improbable that this is a surface conduction, but would clearly seem to prove that there is a general electrification of the entire person.

Each microscopic cell of the body is not only electrified but is in a state of intensely rapid-vibration, a state of infinitely delicate massage. The elimination of dead cells is accelerated, as also their replacement by the constant supply of new cells, while through the nervous system functional activity is increased or restored.

Accepting or not this statement of theory as you please and coming to actual facts, what is the condition of the patient following a treatment? Mrs. A comes to you for treatment suffering with neuritis. She has pain down the right arm, beginning at a point between the shoulders. This pain is worse at the night, and during the previous night she has passed several sleepless hours, finally by aid of a hot water bottle securing temporary relief. Local treatment is given by means of the surface electrode over the painful area for a period of five to ten minutes followed by five minutes of general treatment along the whole spine. Your patient leaves the office with relief from pain, a sense of agreeable warmth over the entire surface treated which lasts for several hours, and a feeling of buoyancy and general well being. At her next visit she reports that the freedom from pain lasted from six to twenty-four hours, and that upon its return it was not so severe as before treatment. At each succeeding visit she tells of longer intervals of immunity from suffering and a gradual decrease of the severity of such paroxysms as do recur, until finally the full effect of each treatment is felt until the time of subsequent treatment. The intervals of treatment can be gradually lengthened to twice a week, once a week, once in two weeks, and finally discontinued altogether, and the relief becomes permanent. Mean-while she notices incidentally that there has been a marked improvement in her digestive system and general health.

In the following out of this case you have discovered several things: First, that the relief of pain is not simply an anodyne action, but depends upon restoration of normal function and conditions, that it is not entirely by reason of stimulation, for there is no reaction, and such relapse as does occur becomes less and less severe and pronounced after each treatment. You, therefore, may conclude that each application has produced a gradual restoration to normal conditions which is added to and reinforced by subsequent treatments. As time goes on without return of abnormal conditions, you also may safely conclude that relief is permanent; in other words, that your patient is cured of one of the most discouraging conditions that falls into the hands of the general practitioner, and, that in subsequent cases of the same nature you can safely promise probable relief. You have accomplished two things. You have acquired a grateful patient and you have received the personal sense of gratification which follows the relief of a stubborn case and a renewed confidence for future efforts in the constant and oftentimes discouraging battle against disease. Better still, you have done this without the use of drugs and feel that you have made a decided step forward in the path of modern scientific treatment.

While we have outlined the above case in a general way, it is not a fancy picture but a composite of actual experiences. As a suggestion of other applications of High Frequency currents let us draw another picture, in its essentials equally true.

Mrs. A is so pleased with her results that she persuades her husband to consult you with regard to himself. He is in the whirl of business, working too hard, worrying too much, eating carelessly and smoking too many cigars. His stomach has "gone back on him." His food distresses him, he is constipated with more or less flatulence in stomach and bowels. His sleep is disturbed and unrefreshing and he begins to fear that his nerves are giving out. He has dosed himself with several kinds of digestive tablets, but only with temporary benefit. In this case general treatment is given along the spine for ten minutes with a current from the body electrode as biting as can be borne without actual discomfort. This is supplemented with a five minute treatment of milder current over the solar plexus and abdomen. He has probably come to you for treatment in the evening and he leaves your office feeling more refreshed than he ordinarily does after a night's rest. His sleep for that night is less disturbed and more refreshing. A course of treatments on alternate days for a period of from three to six weeks puts Mr. A on his feet once more and you see him only at irregular intervals when, after a particularly hard strain, he comes in for a bracer.

Later on little Johnny A breaks his arm and you find that when you have taken off the splint a few applications of High Frequency assist you materially in restoring the circulation and hastening the return of muscular control. Nature would have done this in time, but you have aided Nature; the true mission of the physician.

Each case treated will lead to another, and in the treating will be brought out some new use or possibility of application of this form of therapy. Each operator will *independently* and from his *own experience* establish a line of work *limited only by his own powers of observation and deduction* and the amount of clinical material.

Just a few suggestions as to the various possibilities of High Frequency treatment and we will leave the elaboration to the individual practitioner.

In diseases of the skin there is three-fold action of the applied current, direct stimulation, the antiseptic and germicidal action of the generated ozone at point of application, and the general tonic effect. It forms an important auxiliary to the X-Ray in the treatment of indolent ulcers, morbid growths and glandular disturbances, either by direct application or as a means for cataphoresis. The action on the nervous system has already been sufficiently described. In sprains and bruises it removes the pain and soreness and materially assists reabsorption. In chronic arthritis it hastens the process of recovery and is believed by some to promote the reabsorption even of chalky deposit. It will destroy warts and fungus growths.

THERAPEUTIC USE OF THE X-RAY.

Immediately following the introduction of the Roentgen ray into the field of therapeutics commenced a widespread investigation on the part of scientific and professional men as to its possibilities as a remedial agent. Wonderful results followed this investigation but the fact also was soon discovered that while it was a powerful curative agent it was also a potent agent for harm when indiscriminately applied and many of the earlier experimenters paid a heavy penalty in the way of physical suffering, loss of limb and even of life. The inevitable reaction followed and many of the more conservative medical men condemned its use in toto because of its mischief producing power. Any form of energy misdirected or misapplied will produce disastrous results, it would not otherwise be energy. But, just as death dealing currents of electricity are harnessed and made to serve man in the arts and sciences without danger so long as certain precautionary measures are observed, so the application of the X-Ray has come to be made not indiscriminately, but under certain precautions and restrictions which experience has proven to be necessary, and its use today is the safer because of the very errors of the earlier operators. Forewarned and forearmed the operator of today can avail himself of its beneficial properties with little or no danger to himself or patient.

Let us briefly consider a few of the principal causes of early disaster as disclosed by subsequent experience and investigation.

First, the most mischievous of all the properties of the X-Ray, its effects, either for good or evil are not immediate. An undue exposure today may not show its action for days or in some cases according to several authorities for weeks.

Second, its effects are cumulative, that is, each application produces an effect from which there is not entire reaction, rendering the tissues more susceptible to subsequent applications, which reinforce the effects of their predecessors.

Third, a more or less profound effect is produced upon the nervous and circulatory system, thereby modifying functional activity.

Fourth, the rays penetrate in direct proportion to the degree of vacuum in the tube producing them, and the rays of low penetration are more destructive of tissue while those of higher penetration are more active on nerve and circulatory centres.

Fifth, abnormal conditions of tissue are more easily effected than normal, therefore, abnormal growths may be destroyed by an absorption of rays which leave the surrounding tissues practically intact.

Sixth, the activity of the ray varies inversely as the square of its distance. A radiance which will produce a clear image on a sensitive plate in one minute at a distance of one foot will require four minutes to produce the same effect at a distance of two feet.

Bearing these points in mind, the operator can work with a reasonable assurance of success, and immunity from disastrous effects.

The technique of radio-therapy has changed so rapidly from the time of its introduction, and the methods of individual operators today are so widely diverse that we could not in the space of a small pamphlet discuss them intelligently. Therefore we would refer our readers to the text-books of recent date, and we say recent date advisedly, for, an operator who today should follow the methods of the standard authority of ten years ago would find himself led into gross error.

We therefore shall confine ourselves to a few general suggestions which we hope may be the foundation for a more complete and precise method.

In reading the reports of various cases one is struck by the variety of distances at which the tube is placed from the part to be treated, and the novice is in despair as to whose authority he shall follow. It is well therefore that he should adopt some uniform distance as his own standard, varying the amount of effect to be produced by the length of his exposure. In this case he has one constant factor out of the several to be considered, viz., distance, degree of penetration, volume of current through the tube and length of exposure. His first condition being constant he will easily be able to more or less accurately regulate the others, as with the same exciting apparatus and the same tube they will be practically constant. Incidentally the writer has taken as his constant, one foot; and by the way, when we say a foot we mean one foot from the centre of the tube or target.

Exceptions should be made to this rule in case a protective shield is used, however, as it is quite impossible to direct the ray to the point required unless the shield is nearly, or quite in contact with the skin. We strongly advise the use of these shields, as they not only offer better protection to the surrounding healthy skin but to the operator as well. In treating a case covering considerable surface such as cancer of the breast or acne, it is well to place the tube at a distance of 15 or 18 inches and increase the time of exposure, otherwise only a small area directly under the target will receive sufficient ray to be effectual.

A photographic plate in the same room with an excited tube, and even in an adjoining room will be acted upon by the rays, therefore the whole atmosphere of the room is more or less permeated with radio-activity. This may be more or less weak in its action but the constant exposure of the operator even to a moderate degree of radiance is more or less dangerous, and the men who today are living in this atmosphere are adopting various means to avoid exposure, protective gloves and clothing, ray proof screens or cabinets, or even leaving the room during treatment.

This applies more particularly to the specialists who is constantly exposed to the emanations from a powerful machine. The operator should always remain behind the luminous half of the tube and at least four or five feet distant, while treating a patient.

For the average user who treats not more than four or five patients a day, this is all the protection required.

The most simple and effectual means of protection, both to operator and patient is the use of a tube shield which cuts off all rays except those issuing at right angles to the tube and restricting these to any desired area by the means of diaphragms of varying size. The use of the tube shield also obviates the necessity of covering the patient with cumbersome lead plates, as the area of exposed surface can be limited to a spot an inch in diameter. The tube shield also plays a useful part in the making of radiographs of which we shall have occasion to speak when we come to the subject of successful plate making.

Frequency and length of treatment. In the treatment by X-Ray it is well to make haste slowly. It is generally accepted by the users of this method of treatment that occasionally we find a patient who seems to be particularly susceptible to its effects, therefore it is a good plan to administer one treatment, wait at least a week before repetition and note results. From this time treatments should be given not oftener than every third day, increasing the interval according to improvement made, and discontinuing upon the least appearance of redness of surrounding tissue until at least a week after this shall have entirely disappeared. The length of the first treatment should be from five to eight minutes and the subsequent ones from ten to fifteen minutes.

There is a wide diversity of opinion as to the degree of vacuum of tube to be used according to the experience of the individual operator, but, from the fact that the chemical action of the low vacuum tube is much more powerful, and that even in superficial conditions there seems to be decided action from the medium, or even high tube, it is safer to use the medium or high tube. This has been the method of the writer for the past seven years and in that time he has obtained satisfactory results in a variety of conditions varying from Eczema to Carcinoma, and in no case has there been an appearance of the much to be deplored X-Ray Dermatitis or Burn.

Technique of treatment with the Campbell Coil. With the Standard model the first two condenser C, C, C, switches should be thrown to the right, and the third to the left. (In speaking of switches all positions are regarded from the pivotal point of switch and the same with regard to the rheostat). The current controlling switch P, should be set at the third point from the left and the rheostat switch from one-third to one-half open. Connect tube, throw in main switch and adjust spark-gap until there is an even sparking with no flickering in the tube. Avoid an amount of current through the tube that shall heat the target to the point of redness as such a condition will materially alter the vacuum of the tube. If target commences to redden cut out a portion of the current at the rheostat. In the use of the Campbell Model "D" Coil for X-Ray; the handle C should be turned three points to the right and voltage regulator "P" from one-third to one-half way around to the right.

With both the old and the new model coils the spark gap "S" should be opened as widely as possible and still give a steady light.

A FEW HINTS FOR SUCCESSFUL RADIOGRAPHY.

One of the most difficult as well as important uses of any type of X-Ray apparatus is the production of satisfactory radiographs, and it is in this particular part of his work that the novice is most likely to be disappointed. He has seen beautifully distinct plates with a wealth of detail, produced by apparatus of the same type as his own, or possibly by the apparatus of a rival manufacturer who is seeking to demonstrate the superiority of his coil in this line of work, he fails to get the same class of work and condemns his apparatus as inadequate.

Because we are satisfied that the Campbell Coil is the best X-Ray apparatus among the many types of High Frequency Coils now on the market; because its capabilities in the production of good radiographs rivals that of the better class of direct current coils, and because we desire that our patrons may prove this fact to their own satisfaction, we propose to enter rather fully into the question of radiography, discussing the causes that contribute to unsatisfactory results and offering a few suggestions that will lead to more uniformly successful work.

The writer has been making radiographic plates for the past ten years, and in that time has made use of two types of Static Machines, two types of Direct Current Coils and the Campbell. In this time the largest proportion of satisfactory work has been done with the Campbell, and the annoyance caused by failure on the part of the apparatus to be ready for business at a moment's notice has been absolutely unknown.

To illustrate the factors that contribute to success or failure in the making of a radiographic plate let us try a series of very simple experiments which clearly demonstrate the principles involved.

The apparatus necessary for these experiments is a candle, a lead pencil, and a sheet of white paper. In a darkened room place the lighted candle at a distance of one foot from the sheet of paper, hold the pencil at a distance of half an inch from the paper in a direct line with the candle, and note the result. There is a well defined shadow on the paper, approximately the same width as the pencil. Carry the pencil to a point midway between the candle and paper, still in a direct line, and the size of the shadow is increased and at the same time bears less contrast to the fully illuminated portion of the paper. Bring the pencil back to its original position, move the candle to one side so that it will cast the shadow at an angle of forty-five degrees and note the result. The shadow is somewhat less distinct, it is considerably wider than the pencil, and is at a point one side of the line drawn at right angles to the paper and through the centre of the pencil. Increase the distance of the candle, and, while the distinctness of the shadow is diminished, the distortion is also materially lessened.

Bearing in mind that the radiographic image is nothing but a shadow of different objects of varying density which present more or less obstruction to the free access of the ray to the sensitive plate or screen we have established by our absurdly simple experiments a number of facts which have an important bearing on the production of a truthful and satisfactory image on the plate.

First: the nearer the object to be pictured approaches the plate the more will its shadow be in contrast to the surrounding objects, and the nearer will it approximate in size the object which casts it. Second: as we increase the distance of the object from the plate the more out of proportion is its size, and it is much less clearly defined, by reason of diffusion of light between itself and the plate. Third: if the object is not in a line at right angles from the source of illumination to the plate its shadow will be magnified, distorted and out of true relation with surrounding parts. Fourth: as the distance of illuminating source is increased the nearer the shadow approaches the object in size and the distortion of image, if any exists is decreased.

One more self evident principle is involved, namely, that the contrast of the shadow with surrounding objects increases directly with the increase in intensity of the illumination.

Given an adequate exciting apparatus, the first requisite for good work is a tube of sufficient power and endurance to fulfill the requirements for the most difficult work, and you will find that such a tube is none too good for less exacting cases. It is a great mistake to attempt to use a light anode tube for deep work—or for any work in fact except the treatment of superficial lesion. With such a tube the amount of heating, from current sufficient even for a short exposure, is likely to produce a variation of vacuum during the exposure which will make the subsequent result too uncertain for the production of uniformly satisfactory results, and the life of activity for such a tube is much more limited than that of one whose initial cost is but a trifle more.

Years of experience have led to the fact that for the Campbell Coil the best tube for radiographic work is one of high vacuum, and such tubes as are sent out for use are of this character. The best and most rapid results are produced by a tube of such degree of exhaustion that it will possibly require slight reducing before it will fluoresce. In this event reduce with caution, as after a short run there is a tendency to slight drop in vacuum. Two tubes of identical make and pattern are as unlike as two children of the same parents. One may be industrious, good natured, always ready to do his best, while the other may need more or less coaxing or driving to bring him up to satisfactory accomplishment. A new tube needs to be attuned to the coil before it is at its best and seems to undergo a certain seasoning which gradually brings it up to its maximum efficiency. In breaking in a new tube baby it for a while; do not give it the hardest work at the beginning. If possible to avoid it do not depend upon a single tube for all your work. Two

tubes in use at the same time according to the individual capabilities of each will outlast three tubes bought consecutively and made to do all the work. Above all things do not use the same tube for radiographic and therapeutic purposes. The latter use, from the length of time which it is necessary to run the tube, and the lesser degree of vacuum which is needed for therapeutic purposes, render it unsuitable for first-class plate work. Test out each new tube before using for actual work. A good test is to make a plate of an adult elbow at eighteen inches from the tube (target), expose for two minutes and develop. If image of bones is clear cut and distinct, medullary canals well defined, the outline of the head of the radius behind the ulnar distinct, and the lines of the condyles sharp you have proven that you have a tube of good focus and penetration and at the same time established a standard of exposure for other parts of the body. With the same tube, at the same distance you will calculate your time of exposure approximately as follows: wrist one minute; shoulder three minutes; ankle two minutes; knee three minutes; hip four to six minutes; thorax and upper spine three to four minutes; lower spine four to six minutes.

These figures are necessarily approximate as the amount of soft tissue surrounding the bone will vary widely with the age and weight of your subject. Three factors will have to be determined by estimation which after short experience is easily acquired.

All photographic plates are sensitive to the X-Ray and are capable of furnishing an image but the specially prepared X-Ray plate is enough better for this purpose to more than compensate for the difference of initial cost. On it is produced a denser, clearer image, in a shorter time, and much more easily developed. Just a word as to the care and handling of the plates. They should be kept in a place sufficiently remote from the operating room to be entirely away from the influence of the excited tube. They should be placed in the envelope at the last possible moment previous to use and while being loaded should be kept as much as possible even from the influence of the dark-room light, for, so sensitive are these plates that they will be more or less acted upon even by a combination of ruby and orange light. In placing the plate beneath the body two precautions should be observed. It should be supported by some perfectly flat unyielding object, (a half-inch of plate glass makes a convenient and firm support and at the same time causes little discomfort to the patient). It should be protected from the moisture of the body by a piece of oiled fabric or a folded towel, otherwise there will be sufficient chemical action from the black envelope to materially injure the plate as the writer has found to his cost by sad experience. After exposure protect the plate from daylight as much as possible, and develop, or have it developed as soon as convenient. If possible do your own developing. This is advisable for several reasons. The development of an X-Ray plate differs materially from that of an ordinary photographic plate in that to bring out its full detail and make it of sufficient density for satisfactory inspection by transmitted light development should be carried to a point considerably beyond that which is required for the ordinary negative. An ordinary negative is either properly exposed, over exposed, or under exposed. The X-Ray plate is all three. A certain part of it has received just the proper amount of exposure while other portions have been over and under exposed. Therefore instruct your photographer to treat it as he would an over exposed plate, carrying the development to a point where the thinnest part of the plate is opaque to transmitted light, at the same time avoiding fogging. By developing his own plates the operator has in the development an accurate key to his errors in exposure and will sooner learn to correct them than when they are developed by some one else. At the same time he will be able in case he is somewhat in doubt as to the result of his exposure to develop the plate while the patient is still in his office, and repeat the exposure at once if necessary. In the case of a foreign body to be located, the plate can be immediately developed and the offending substance removed before the patient leaves the office. This is particularly important in the case of needles, as when the removal is attempted some hours subsequent to the exposure it is often discovered that the location of the needle has materially changed. This is a source of annoyance to the surgeon as well as to the radiographer, to say nothing of the patient.

We believe the operator will get better results by using a special X-Ray developer recently put upon the market, called X-OL developer. As supplied by the manufacture, X-OL consists of two elements, put up as X-OL Developer and X-OL Salts. These may be compounded in any quantity, using the following proportion:

FORMULA

X-OL Salt	2 oz.
X-OL Developer	$\frac{1}{8}$ oz.
Water	10 oz.
Bromide of Potassium (25 per cent. solution)	1 dram

This developer may be used repeatedly until too weak or discolored. Keep temperature below 80 degrees F. when developing.

PRICES

X-OL Salts per 1-lb. bottle, 35c. X-OL Developer per 1-oz bottle 30c.

The time required for a proper exposure depends upon three principal factors. First; the amount of resistance offered to the ray by the part to be pictured. Second; the degree of penetration and volume of current passing through the tube. Third; the distance of the tube from the plate.

By the adoption of a constant distance of tube from plate one of these factors of uncertainty will be removed, and, with the Campbell Coil, the tube once tested out its subsequent action will be practically constant. This will leave as the only uncertain factor the penetrability of the part to be radiographed. This the operator will soon learn to estimate with a fair degree of accuracy. Experience has proven that the distance of eighteen inches between tube and plate is a convenient one as even in the case of the thicker portions of the body it does not bring the tube unduly near the patient nor does it require an unduly long exposure.

Aside from the rays issuing practically at right angles to the tube there are also apparently wandering rays tangent to the surface of the tube. The use of a tube shield will cut off these wandering rays giving a more sharply

defined image and at the same time protect the patient from general exposure to the action of the rays. Owing to the comparatively short time of exposure the danger to the patient is practically nil yet within the last few years has developed the fact that there is a decided inhibitory action upon the organs of generation, even of operators who are remote from the direct rays of the tube. The amount of susceptibility to this action and its duration has not yet been accurately determined, therefore it is better to err on the safe side and avoid any exposure whatever of testicles or ovaries to even indirect radiation.

In a recent case where it was thought advisable to sterilize a man by means of the X-Ray, it was found necessary to give 27 treatments of 15 minutes each at a distance of 15 inches, before the spermatzoa were entirely absent. A powerful coil was used in this case, so it would appear that the average user has little to fear on this score.

In making a radiographic plate the prime requisite is that the part to be pictured shall be as comfortable as possible and in a position which is likely to avoid the least degree of motion during exposure. The tube should be placed with its long axis parallel to the plane of the plate and the centre of the target in such a position that a plumb line dropped from its centre will fall directly on the centre of the plate, and at right angles to it. Start the tube with a small amount of current, gradually increasing the volume, until the desired amount is passing through the tube. From this point time your exposure. Adjust the spark gap until the tube does not flicker but gives a steady and even degree of radiance as wide open as possible. When the exposure is finished, reduce the current, and then throw off the main switch. By the gradual increasing and decreasing of current through the tube possible puncture is avoided and the tube is not subjected to a sudden or undue strain.

In the case of fracture, or suspected fracture, when possible make two plates in planes at right angles to each other. An apparent perfect relation of fragments in one plate will often show deformity in the other. Two plates are also of great importance in the locating of foreign bodies. In making a radiograph of the hip have your patient if possible partly turned on the injured side. In this position the femur is considerably nearer the plate and the axis of the neck more nearly parallel to the plane of the plate. The shadow will be more in contrast with surrounding parts, the foreshortening of the neck will be less and the outline of the acetabulum more definite.

Given the best apparatus and a skillful operator and not every plate is a success. With so many uncertain factors there are necessarily some poor plates and some failures. Neither the operator nor the manufacturer of a coil take pains to exhibit the poor work or dwell at length upon the failures. Perhaps you have noticed this same tendency in other branches of professional work. But, what has been done can be done again, with the same conditions under which successful plates have been made you can repeat the results for yourself. We have tried, and hope we have succeeded in so doing, to give a few hints that will enable you to avoid some of the stumbling blocks. If you do not get the results that you should reasonably expect, communicate with us and we will give you further assistance.

TECHNIQUE.

With regard to the technique, when a soothing effect is desired as in sensitive or inflamed areas, use the glass vacuum electrode in direct contact with the skin. If counter-irritating effect is desired, as in chronic conditions, or in the treatment of ulcerations where a free production of ozone and stimulation gives the best results, apply through several layers of bandage, or clothing. The spinal treatment may be given through light underclothing and the slight sting of the spark is not altogether disagreeable and at the same time somewhat more stimulating in its action. In working about the head and face it is well to use the finest discharge from the electrode and keep it constantly in motion. In the use of stronger currents this constant moving of the electrode is essential, else the application will become painful and an excessive local irritation will result. It is not unusual that a general redness of treated surface, due to increased capillary circulation, should follow application; indeed in many cases this is desirable and the sensation of grateful warmth is due to this increase of vascular action. But, be sure that this is not allowed to pass the point of stimulation which becomes irritation.

With the first treatment of a patient it is best to begin with the mildest current, gradually increasing its strength at subsequent sittings up to the desired point of intensity. A large proportion of people taking a treatment for the first time, and more especially women and children, are more or less apprehensive and expect to be hurt, or at least to experience more or less profound sensations. One judiciously applied treatment dispels this apprehension and at subsequent sittings you have the perfect confidence of your patient which is so essential in any method of treatment, but particularly so in any form of mechanical therapeutics. In applying the more irritating currents it is well to hold the electrode in your own hand until it is in direct contact with the surface to be treated, thereby avoiding the disagreeable sparking which accompanies its approximation.

One point we would emphasize. Be sure that the first impression of your patient is an agreeable one, for on this depends your success or failure, not only on the case in hand, but also in subsequent ones. A large proportion of sufferers, especially those from nervous disturbances are prone to discuss their various symptoms and experiences and are free to criticise the methods of their physician from their own point of view, without regard to its actual merits or demerits. Therefore, be sure and send your patient from your office with a favorable impression.

REPORTS OF TREATMENT.

WITH GENERAL SUGGESTIONS.

ACNE. J. H. R. came to my office after repeated efforts to cure himself by patent remedies, and after failure to get relief by these and other old fashioned methods of treatment. I used the X-Ray with medium tube first on one side of the face and then on the other, placing the tube at eight inches from the affected parts. I gave this treatment ten minutes at a time every other day. On alternate days I applied a fine discharge from the pointed vacuum electrode directly to several large pustules. The pustules were entirely reduced at the end of ten days, and the patient was discharged cured at the end of a month's treatment.

I have cured nearly a score of such cases. I always impress my patient with the importance of regularity of treatment, and of not becoming discouraged because the affection appears to be aggravated during the early stages of treatment.—Dr. H. L. J.

A number of operators report similar success in this obstinate and annoying condition.

ACNE ROSACEA. I have successfully treated several cases of Acne Rosacea by the X-Ray, using a medium tube, ten inches from the surface, giving treatments on alternate days. The High Frequency current should be applied with the vacuum electrode, either on alternate days, or if conditions are favorable, every day.—Dr. E. M. S.

ACTINOMYCOSIS. F. J. C. came to me for treatment. I applied the X-Ray with the low tube ten inches away, from ten to fifteen minutes at each sitting. He could come but twice a week but was cured in ten treatments. I did not find electrolysis necessary in this case but have used it to advantage.—Dr. M. W.

ALOPECIA AREATA. A number of authors report success in the treatment of this condition by application of the X-Ray to affected areas. A medium tube has been used at a distance of eight inches, and from two to five applications of ten minutes duration. This has resulted in epilation of the affected parts and the subsequent growth of normal hair.

ANUS, FISSURE OF. Dr H. P. reports treatment in three cases. All secured relief and one, after a year's time, appears to have been entirely cured. "I used the Campbell High Frequency Coil with vacuum tube in contact, varying the strength of current and giving an occasional spark. Avoid tiring patient with too long treatments."

ARTHRITIS DEFORMANS. Prolonged use of the X-Ray and the High Frequency current not only relieves the pain and prevents farther development of the disease, but has proved in a considerable number of cases, to have a decidedly curative effect.

ARTHRITIS RHEUMATOID. Patient — female, 38 — had lost use of right hand, and muscles were withering; suffered extreme pain. Tried various proposed remedies including baths, massage and local applications of iodine. Came to me for electrical treatment. Gave general tonic applications with special applications of effluve to hand. After three months' treatment, twice weekly, use of hand restored and general health.—Dr. J. E. B.

ASTHMA. Mrs. L., 32, came to me for medicinal treatment for stuffiness in her throat that kept her awake nights. I proposed treatment with the High Frequency current but as she manifested prejudice against it, tried medicinal treatment, tonics, etc., without improvement. Decided that it was incipient asthma. Patient returned following winter for treatment and conditions were worse than the year before. She willingly yielded to electrical treatment and I placed her on the auto-condensation couch for fifteen minutes. Asthmatic attack was relieved the first night and diminished steadily with daily treatments until entirely gone at the end of one month. Though the weather was unusually "favorable" for recurrence there was none, nor has there been during the last two winters.— Dr. L. C.

Any case of Asthma due to defective metabolism or a neurotic condition, should be promptly relieved, or even cured, by the use of the D'Arsonval current through our "Auto Pad." We have reports of a considerable number of cases cured.

BAZIN'S DISEASE. (Scrofulous ulcers of the legs.) Patient female, age 20, anaemic, extremities cold, a number of ulcers on the right leg; no tubercular history. Thirty applications of High Frequency current made in three months, giving spray effluve with flat electrode on limb, and general treatment for ten minutes on auto-condensation couch. Ulcers closed leaving skin smooth and clean, and there has been no recurrence. — Dr. B. E

BARBERS' ITCH. This disease has been treated successfully by many operators both abroad and in this country. Both the X-Ray and vacuum electrode have been used with success. For detailed methods see any one of the recent textbooks on Radio-therapy.

CARCINOMA. Reports of complete and speedy cures of superficial growths by the use of the Campbell X-Ray have been sent in from no less than eleven states and representing the successes of scores of physicians. The majority of treatments have been with a medium tube at a distance of one foot, the exposures varying from eight to fifteen minutes. Deep seated growths have been treated with apparent success by the use of a high vacuum tube at a distance of from one foot to eighteen inches.

CATARRH NASAL. This condition has been successfully treated by the High Frequency current applied as a general tonic and directly to the affected parts by the use of the nasal or post-nasal vacuum electrode, using a very mild current. Local treatment has lasted from one to three minutes, depending upon the toleration of the patient.

Atrophic Rhinitis and Ozena are very much benefited by the vacuum electrode, the odor and discharge being promptly relieved. Some cases of Ozena have been reported cured.

CERVICAL GLANDS, ENLARGEMENT OF. Dr. F. reports the cure of a number of cases of cervical adenitis both with and without suppuration. Treatment has been given with a high vacuum tube at a distance of one foot. Duration of treatment five to ten minutes and at intervals not less than five days. Almost from the first treatment induration becomes less and there is a gradual reduction of size. Discharge if any decreases and gradually disappears after a few treatments and scabs drop off leaving slight scar. One particularly persistent case which had recurred yearly for a period of five years, with increased severity each year, yielded to a course of several months' treatment, and in five years has shown no sign of recurrence. In fact, so far as known there has been no recurrence in any of the cases which he has treated. In none of these cases has there been any dermatitis, and upon the appearance of the slightest degree of redness treatment has been discontinued until one to two weeks after its disappearance.

CHLOROSIS. Miss G.—22 years old—came to me for treatment after her parents had spent large sums with other physicians. I discharged the patient cured after six weeks' treatment, three times a week. I administered the High Frequency current by auto-condensation, each treatment lasting fifteen minutes.—Dr. J. C. D.

COLITIS-CONSTIPATION. Chronic case of over twelve years standing. Mrs. J. S. B.—35 years old—could not have movement without strong cathartic or enemas. I made abdominal applications of High Frequency current, fifteen minutes daily for three weeks when bowels began moving regularly. Patient gained twenty pounds in two months and is now well one year after treatment. — Dr. H. O. B.

Auto-Condensation two or three times a week for ten minutes together with the local application of the vacuum electrode over the colon, will usually relieve the cases. Where constipation is a marked symptom, the use of the insulated rectal electrode will prove efficient.

DEAFNESS, CATARRHAL. Patient, female, 48, has been unable to hear except by use of ear trumpet and then with great difficulty at times. I adopted treatment with small High Frequency electrode applied to each ear alternately for five minutes. This was followed with fifteen minute treatments on auto-condensation couch, during which region of ears was massaged gently. Immediate improvement of general conditions was noticeable After two treatments a week for three months hearing was much improved;

recovery of hearing complete after treatment continued greater part of a year. Nasal catarrh which was also serious, disappeared without special attention.— R. Q. T., M. D.

DIAGNOSIS. I use the Campbell X-Ray apparatus constantly for fluoroscopic work in diagnosis. It is indispensable.— Dr. D. C. T.

DIABETES. Can be greatly relieved and progress of disease retarded by local application of High Frequency current, front and back, with mild effluve. Excellent results have been reported where patients were unable to leave their homes.

Auto-Condensation is also of the greatest service in these cases.

Dr. S. writes: "I have been appealed to in three instances where the patients were suffering with advanced diabetes and confined to their beds. The first treatment (brief because of the patient's weakness) with the High Frequency current from the Campbell portable coil gave great relief. In two cases the patients left their beds after the second treatment, and the lives of all three were prolonged many months in comparative comfort. I believe that I could have cured them had I been called in the first stages of the disease."

DYSPEPSIA. Dr. L. J. writes that he has secured prompt and satisfactory results by treating mild cases of dyspepsia with the High Frequency current and cured one case of over twenty years standing. Patient, male, 51 years old, had suffered excruciatingly for over twenty years; greatly reduced in flesh, nervous and despondent. At time of first treatment had eaten nothing for forty-eight hours. General treatment was given with the High Frequency, special applications being made over the region of the stomach for ten minutes. Marked improvement was noted from the first. Patient came daily for three weeks then every other day for a month and was discharged cured.

ECZEMA. Many cases have been reported by a host of operators of cure by the X-Ray. Reports of cures by the High Frequency applied by the surface vacuum electrode are also numerous. A combination of the two methods has seemed in many cases to give the quickest and most satisfactory results. Perhaps no single disease has been as universally treated with the X-Ray as eczema and with such a large proportion of satisfactory results. Here the stimulating and not the destructive effect of the X-Ray should be used, hence the treatment should not be too prolonged.

EPITHELIOMA. This is the one disease of the cancer family in which the use of the X-Ray has been least disappointing and many scores of cases have been reported of entire cure by this method of treatment.

The destructive effect of the ray is required in these cases and consequently the case should be carefully watched and the treatment stopped for at least three weeks on the appearance of a mild dermatitis. Too small an amount of X-Ray acts as a stimulant and consequently an epithelioma will be

aggravated if a stimulating instead of a destructive dose is given. Protect the surrounding surface with lead foil, leaving a ring of healthy tissue around the lesion and watch this ring carefully for reaction.

EYES. Various conditions of the eye, varying from simple conjunctivitis to the deeper seated and more serious conditions, have been beneficially treated by the application of a mild current of extreme frequency by means of the special eye electrode. In treating the eye it is well to proceed with extreme caution, avoiding any local irritation.

FAVUS. Dr. B. U. Y. reports one case apparently cured by the use of the X-Ray, medium tube, applied from six to ten minutes every second day for a month, and there are a number of cases reported as having been successfully treated by European operators.

FURUNCULOSIS. Dr. J. C. D. has secured excellent results by the use of mild sparks from the High Frequency coil given for a brief time daily.

GASTRITIS, CHRONIC. "I was attending a patient, female, 40 years old, who had been subject for several years to severe attacks of Gastritis, confining her to her bed from a week to a month at a time. I heard of the Campbell High Frequency coil and bought one, hoping (I must admit as a last resort) that by taking the coil to the bedside of the sufferer I could perhaps save her. The result was beyond my highest expectation. Improvement noticeable after the first treatment. Gave general treatment with localized effects by means of the D'Arsonval attachment ten to fifteen minutes daily for two weeks, and three times a week for six weeks. Patient continued treatment at my office once a week for three months, and a year and a half from the time of first treatment has had no recurrence of trouble." —Dr. L. B.

GLEET. Scores of cases of speedy relief and prompt cure have been reported. To mention one, Dr. S. A. R. writes: "Patient 25 years old, was suffering with Gleet and Stricture and had tried numerous remedies without relief. I administered the High Frequency current through urethral electrode for three or four minutes. First treatment gave relief and patient was discharged after four sittings in eight days. If urethral electrodes cannot be used rectal electrodes will give relief, as will large surface electrode in contact with the perinaeum.

GOITRE. Dr. A. R. D. of Oregon reports one bad case: "Patient female, 40 years old, growth hard and prominent. Gave X-Ray treatment with medium tube daily for three or four minutes at first, increasing the time to five or six minutes, always following with effluve from High Frequency for a few minutes. I found that hand and vibratory massage was an excellent accompaniment. The goitre disappeared almost entirely at the end of six weeks. Patient was so much pleased with the removal of the disfigurement and secures so much benefit from High Frequency application that she has continued regular treatment." A number of cases have been reported as cured by the use of the X-Ray, either alone or alternated with the High Frequency. It is well to bear in mind the possibilities of treatment by cataphoresis.

GOITRE, EXOPHTHALMIC. This distressing disease is probably more amenable to the X-Ray and High Frequency treatment than any non-surgical method. The writer has known of some twenty cases either symptomatically cured or very much benefitted. An application of the X-Ray for five to seven minutes and the vacuum electrode for an equal time seems to give the best results. An article in the Journal of the American Medical Association, March 7, 1908, by Finley R. Cook, M. D., gives details of treatment and results in five cases so treated.

GOUT. Many instances are reported where immediate and grateful relief has followed local treatment with the High Frequency current. To obtain the best results mild treatments should be given daily, suspending during acute exacerbation.

Auto-Condensation improves the metabolism and is indicated in all stages of gout. The results are superior to any other method of treatment.

HEADACHES. Will be relieved at once by application of mild effluve over affected area and along cervical vertebrae. Treatment should be continued until pain ceases. Reddenning of the surface treated indicates that the application has been of sufficient length.

HEMORRHOIDS. Dr. M. S. reports two cases cured. One specially bad one was a young woman, 35 years old, who had suffered for fifteen years, at times being unable to either stand erect or sit with comfort. Says the doctor: "Being very much debilitated I began treating her with High Frequency for the general tonic effect, and also applied the current with rectal vacuum electrode five to ten minutes daily during two weeks. Then I gave one treatment weekly with application of the vacuum electrode fifteen minutes. Improvement was steady from the first until patient was discharged three months later."

Patient, male, 36 years old. Hemorrhoids would protrude on defecation. Used High Frequency current with rectal electrode twice a week for three weeks.—Dr. S. A. D.

HYSTERIA. The auto-condensation couch will be found especially valuable in treating cases of Hysteria. Give mild treatments with the High Frequency being careful not to alarm the patient with the sparking of the coil.

The current obtained from our "Auto-Pad" is parlicularly well suited to these cases, as there is practically no-sensation even though the patient may be receiving 500 or 600 milliamperes; she being comfortably seated in any chair with one electrode in the hand, there is nothing disagreeable or distasteful about the treatment.

INDIGESTION, INTESTINAL. Dr. R. P. O. of New York city writes: "Patient, male, 45 years old, in bad condition, vitality very low. Gave daily treatments at his home with Portable High Frequency coil for one week. Continued same treatment second week, introducing the auto-condensation couch. During third week used the High Frequency current with D'Arsonval attachment. Improved condition was noticeable from the first. Treatments continued with diminished frequency for two months when patient was discharged cured and grateful."

INDIGESTION, ACUTE. Dr. C. W. R. writes: "Patient, male, 50 years old, has been a long sufferer. Accustomed to hard labor but often forced to quit work in the middle of forenoon or afternoon because of pain so intense that he rolled on the floor in agony. First treatment with High Frequency current gave immediate relief. Continued treatment at irregular intervals for two months when patient ceased calling, saying that he was not troubled any more. My treatments were general with local application to region of stomach until pain ceased."

INSOMNIA. By electricity the sleep that is produced resembles that of childhood, and it is unaccompanied by any headache, disturbance of digestion, constipation, or nervousness, all of which symptoms are accustomed to be met with in those for whom sleep-producing drugs have been prescribed. The sleep which electricity gives rise to is not only sound but decidedly refreshing, and—still further—not only do High Frequency currents induce sleep but they improve the tone of the system to such an extent that the patients are better fitted to resist and overcome the evil influences of business, educational or domestic cares or anxieties.—"Somerville H. F. in Insomnia," 1906.

KELOID. X-Ray will permanently cure a large proportion of these cases. Medium tube at about twelve inches two or three times a week until slight reaction occurs.

LARYNGITIS, CHRONIC. Dr. T. R. R. urges us to emphasize the value of High Frequency currents in treating obstinate cases of Laryngitis. He secured prompt relief and speed cures in five cases by using the vacuum electrode designed for throat work. The localized treatment should not be prolonged enough to increase the inflammatory conditions.

LEUCORRHOEA. Mrs. J. has been coming to me for treatment for some months but no relief was apparent by the old-fashioned methods of treatment. Upon her next call after I had installed my Campbell coil I decided to try its possible effects, using the vaginal vacuum electrode. I proceeded cautiously, using electrode but three minutes. Insisted upon daily treatments, increasing the length gradually to ten minutes. Patient was discharged apparently well after four weeks; no recurrence of trouble noted after an interval of six months.—Dr. P. R. D.

LOCOMOTOR ATAXIA. Physicians should not discredit electrical treatment for this disease because it will not yield in every case. Its progress can be retarded, however, pain relieved and the use of opiates and drugs eliminated.

"R. T. U. came into my office supported by an attendant on either side. It was unnecessary for him to struggle in again for I took my Portable to his home. After daily treatments for four weeks, he surprised me by walking nearly a mile and up a flight of stairs to my office. He said: 'One good turn deserves another,' and paid his bill. The amount received was a good proportion of the first cost of the coil."

"I took the coil to the home of another sufferer (on recommendation of first patient) who had been confined to her bed for over two years. This patient also walked into my office within a month.

Besides the general application of current for tonic effects, I used a special vacuum electrode frame containing seven tubes, on which I allowed patients to sit or recline for twenty minutes at a time. Treatments were given daily."—Dr. T. A. C.

LUMBAGO. Immediate relief with subsequent apparent cure follows the use of the High Frequency currents in Lumbago. I have also used the D'Arsonval attachment to get a strong reaction which takes the place of vibratory massage and with, I believe, better results.—Dr. J. Q. A.

LUPUS. Middle aged man with lupus patch of twenty years standing, about the size of half a dollar, at corner of mouth. During this time had been treated by caustics and other methods but gradually growing worse in spite of temporary improvement. Two treatments were given two days apart with high vacuum X-Ray tube held at one foot distant for fifteen minutes. Such an amount of irritation followed second treatment that it was discontinued for two weeks. Then irritation had disappeared, scab was dry and hard and inclined to separate at the edges. Thirteen treatments were given, before the last of which the scab had dropped off leaving slight scar which has since bleached, leaving very slight disfigurement.—Dr. C. F.

Treatment for lupus in the same as for epithelioma, the destructive effect should be obtained and the surrounding parts properly protected. As high as eighty per cent. of cures have been reported by this method.

MOLES. The High Frequency spark from one of the small vacuum electrodes as strong as can be borne until the mole becomes bloodless. This can be done under cocaine with less pain and in less time.

NEURALGIA. Female patient, age 50, was subject to chronic attacks of acute pain in the supra-orbital nerve, often accompanied by swelling and congestion of the eye-ball. The attacks were reported as occurring about once in three weeks and patient had several times resorted to morphine for relief. The first two treatments of ten minutes each with the High Frequency applied with the surface electrode, followed by auto-condensation and gentle massage over affected nerve, reduced swelling and relieved pain. Pain ceased entirely after six treatments. Treatments given every other day for six weeks with no recurrence of attacks. Patient has called once a month for the last six months for general treatment—not because of recurring neuralgia, but because she enjoyed the tonic effects of the treatments.—Dr. W. A. J.

NEURITIS. Dr. B. was visited by a woman, 43 years old, who had suffered for three years with severe pains in her right arm and shoulder. Other physicians had bandaged, poulticed, and painted the affected member, finally advising "letting it wear itself out." Dr. B. used the High Frequency current applied to exposed surface with vacuum electrode, accompanied by gentle massage. The patient says: "I felt the best I had felt in years after the first treatment and I went every day. Before the end of the first week all the pain was gone, I could move my arm easily and my general health was much improved. I kept the treatment up for another week. This was a year ago and I have been all right ever since."

This is but one of scores of similar cases reported. So uniform are the reports of successful treatment of this annoying condition by the High Frequency that it may be considered as almost a specific.

NERVOUS DEBILITY. "I undoubtedly saved a young woman, 27, from a serious attack of nervous prostration. She had become chronically affected with insomnia, ate little, was badly run down and was taking frequent doses of morphine to "put her to sleep." After prolonged auto-condensation treatments daily for four weeks, natural sleep was restored; after daily treatment for three months, health was completely restored."—Dr. E. B.

NEURESTHENIA. This condition is treated with better success by some form of High Frequency current than any other method, either electrical or medical. The D'Arsonval is usually most efficient as well as most easily applied. Our "Auto-Pad" will be found indispensable in the treatment of these cases. It can be used in an ordinary chair and requires no special preparation on the part of the patient. The Thermo-Faradic current will give the patient 300 to 400 milliamperes of current with absolutely no sensation, while with our regular D'Arsonval attachment from 800 to 900 can be obtained.

PSORIASIS. Patient, a woman, suffering aggravated attack, involving entire trunk, both chest and back, and posterior aspect of thighs down to knees. Made ten minute exposure of entire chest and back with high vacuum tube, anode eighteen inches from the surface that as much area as possible might be covered. Relief after first treatment; after third profuse desquamation, cessation of irritation and no new invasion. Cure complete after five treatments and no return of disease at the end of five years.—Dr. C. H. F.

This is one of some twenty cases which have been treated by this physician with but one failure. In that case the patient insisted on too frequent treatments as he wished to hurry up the cure. A slight dermatitis followed which so discouraged the patient that he abandoned the treatment. All other cases were completely relieved in from three to a dozen treatments and invariably given with a high tube at intervals not less than once in five days, his theory being that the beneficial effect is from the tonic rather than destructive effect of the ray, and that the benefit occurs from stimulation of the peripheral nerves rather than direct action on the lesion. The results seem to substantiate the technique if not the theory.

RHEUMATISM, ACUTE. Patient female, 40, was great sufferer with all the sequelae of anaemia, insomnia and muscular atrophy; left arm was quite useless, joints stiffened and painful. Treated patient in her bed by means of Campbell portable coil, passing flat glass electrode over entire surface of the body. Time of first four treatments on alternate days was half an hour. After two treatments insomnia disappeared and patient improved so rapidly that for subsequent treatments she came to my office. Auto-condensation couch was then used, treatments lasting ten minutes. After two months with treatments three times weekly patient appears entirely relieved. Massage was used in conjunction with the current.—Dr. R. E. V.

RING-WORM. X-Ray has proved very efficient in these cases and in Ring-worm of the scalp, nearly a specific. Ten minutes, medium tube twelve inches is the usual method.

RODENT ULCER. Same treatment as epithelioma.

SARCOMA. Young lady has been twice operated upon for sarcoma of lobe of left ear, with recurrence each time. Conditions, tenderness, some induration and constant oozing, forming moist scab. Five treatments were given with high vacuum X-Ray tube at one foot. All tenderness disappeared, induration was removed and scab became dry. Patient did not return for seven or eight months, when a slight tenderness was manifest. Twelve treatments were then given and patient discharged with no evidence of trouble save loss of tissue from early operations and slight scar.—Dr. C. F.

SCIATICA. A blacksmith, big and husky, age 48, came to me for treatment after suffering severely for nearly a year. He was in constant pain. By the application of the High Frequency current ten minutes daily for two weeks with surface electrode following brief treatments on the auto-condensation couch the pain was entirely removed. I should mention that massage accompanied the treatments. Has reported frequently during the last two years that there has been no recurrence of the pain.—Dr. T. A. R.

SPRAINS. Patient female, had badly sprained and bruised right wrist, effusion of blood unusually abnormal. Two treatments with High Frequency current for fifteen minutes at an interval of forty-eight hours, reduced swelling and discoloration. Patient telephoned next day that the wrist was all right and that she would not need another treatment.—Dr. A. S. R.

STOMACH, (See Indigestion, Dyspepsia, Gastritis) **ATONIC DILITATION OF.** My records show two cases both of which were referred to me by physicians who were not equipped for electrical treatment. Both were relieved after the first treatment with effluve from your High Frequency coil applied for five minutes in one case and eight in the other, followed by auto-condensation. Treatments were given daily, except for unavoidable interruptions, for three weeks. After nine months there is no recurrence of trouble.—Dr. W. E. D.

SYCOSIS. These cases are amenable to the X-Ray or High Frequency treatment, medium tube for eight or ten minutes at twelve inches supplemented by the vacuum electrode, will usually cure the case.

TORTICOLLIS. A young woman came to me with her head stiffly held to one side. She was anaemic and a great sufferer. Scores of suggested remedies had been tried and many physicians consulted. Three applications of High Frequency on alternate days with vacuum electrode passed over neck and shoulder gave entire relief. Patient continued general treatment, however, twice a week for four weeks. Results permanent.—Dr. M. A. R.

TRACHOMA. A young man, age 25, employed in a cotton mill, came to me to see what my machine could do as a last resort. I gave careful advice as to diet, and general mode of life, emphasizing cleanliness and began auto-condensation treatment accompanied with massage of eyelids, and also very fine current through the special eye electrode. Treatments twice a week continued for three months. Complete cure is apparent. —Dr. P.

TUBERCULOUS GLANDS (See Cervical Glands.) Girl aged eight, family history tuberculous, cervical glands much enlarged on both sides. High Frequency treatment given daily for fifteen minute periods. Swelling reduced after first week; after six weeks cough almost gone and glands could be discovered only on close examination. Treatments were interrupted for a month. Resumed and continued for two months when glands had disappeared and patient was in greatly improved general health, which has continued.—Dr. W. B.

The X-Ray for about five minutes, in addition to the High Frequency current through the vacuum tube, will materially assist in curing these enlarged glands. Superficial tubular lesions of all sorts, including ulcerations, sinuses and tuberculosis of the skin and smaller joints, have been reported cured by means of the High Frequency current.

TUBERCULAR AREA in posterior part of right lung. Patient female, 35; High Frequency treatment daily lasting from five to eight minutes during a period of four weeks. General health of patient much improved. Acne on back which was very severe disappeared while lung was being treated.—Dr. S. A. D.

TUMOR, FIBROID. "Patient 46 years old, married, two children; good health till two years previous; then menstruation began to be too frequent; periods came every ten days, finally practically continuous flow and very profuse; had usual nervous symptoms; pronounced pressure symptoms above pelvis."

"Bi-manual examination revealed large fibroids involving particularly anterior portion uterine walls extending to posterior portion in lesser degree; mass extended quite as high as level of umbilicus; vagina was drawn up into a long canal; constipation pronounced; defecation with great difficulty; extreme sensation of weight about pelvis.

"Operation refused and physician refused to accept further responsibility for treatment. Nineteen treatments were given during a period of five months with the X-Ray. A soft tube was used, held at eight inches from the abdomen, and the duration of treatment was from ten to fifteen minutes; no removal of clothing except corset; rapid and absolute disappearance of the mass; last application July, 1906; October 16, 1907, patient in perfect health. Menstruation regular but decreasing owing to change of life. Has gained flesh and looks well. During period of observation before treatment thyroid and eralgine were administered; no relief. No medicine was given during the treatment with the X-Ray or for two months previous."—Dr. W. F. J.

TUMOR, UTERINE. Mrs. R. S., 40 years old, came to me for treatment after being told by other physicians that only an operation could afford relief. Applied High Frequency by vacuum electrode five to seven minutes daily. Patient's general health improved from the first. Tumor appeared to be reduced after ten treatments. Then treated on alternate days for two months when tumor was completely reduced.—Dr. G. J. B.

TUMORS, VASCULAR. In several cases I have checked the growth of vascular tumors, seemingly with the first application of the X-Ray applied cautiously, increasing the time of exposure up to ten minutes. Care should be taken to avoid burning. In two cases I completed the absorption by electrolysis; in the third this was not required.—Dr. F. A. P.

ULCERS. A number of reports of the successful treatment of ulcers including indolent, rodent and syphilitic are made by many operators. In these cases results have been accomplished by the X-Ray, the vacuum electrode, and their combined or alternate use.

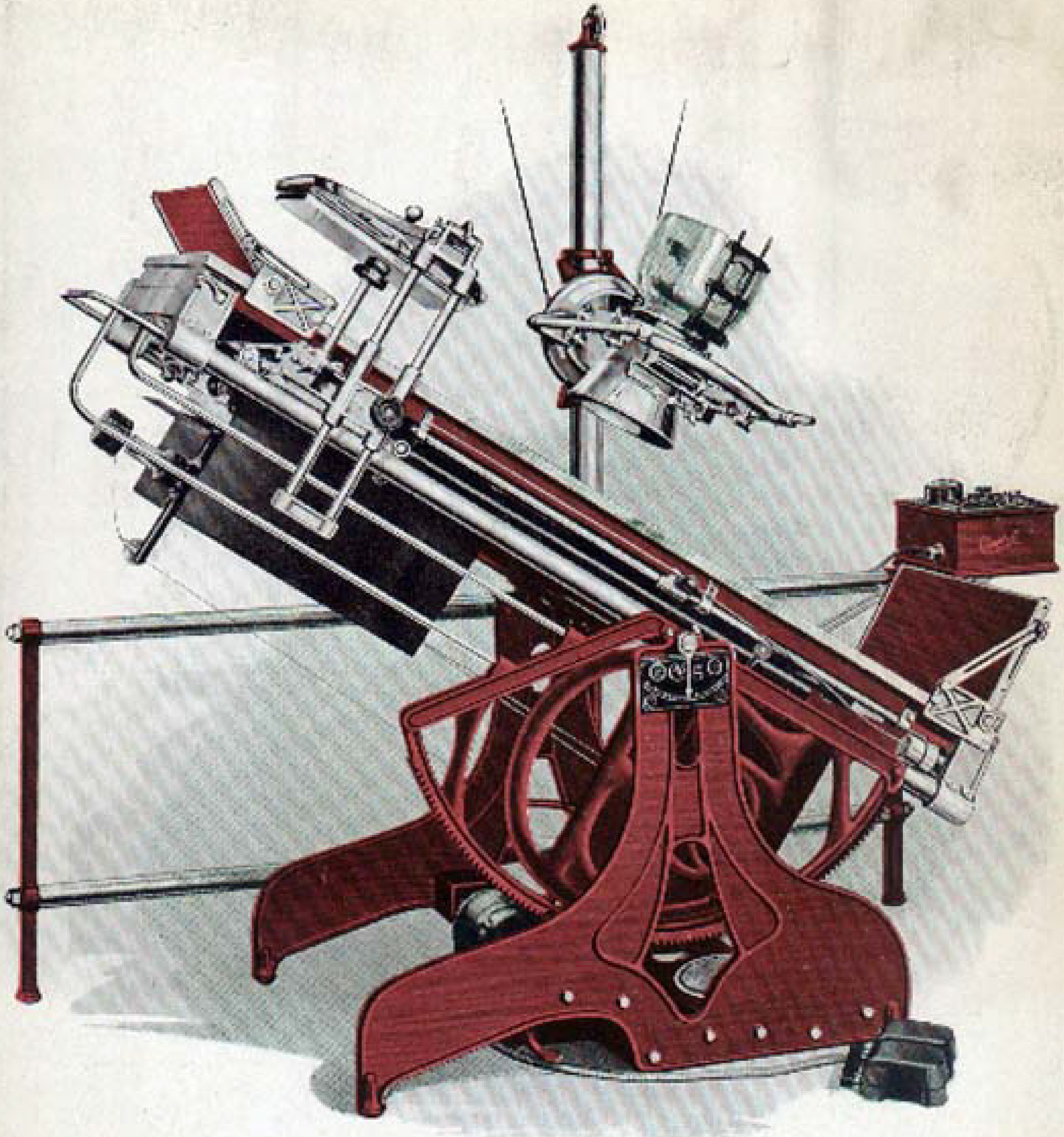
Best results are obtained by using the vacuum electrode through several layers of bandage, thus getting the stimulating effect of the short spark and an abundant development of ozone.

UTERINE DISEASES. Erosions, emdometritis, sub-involution and all neurotic conditions are much benefitted by local application by means of an insulated vaginal electrode.

WARTS. These disfigurements can be removed by the application of a fine spark discharge from a pointed vacuum electrode given to the point of irritation. Repeat if necessary but not until all irritation from previous treatment has disappeared.

RADIOGRAPH MADE WITH A CAMPBELL COIL

Clinix



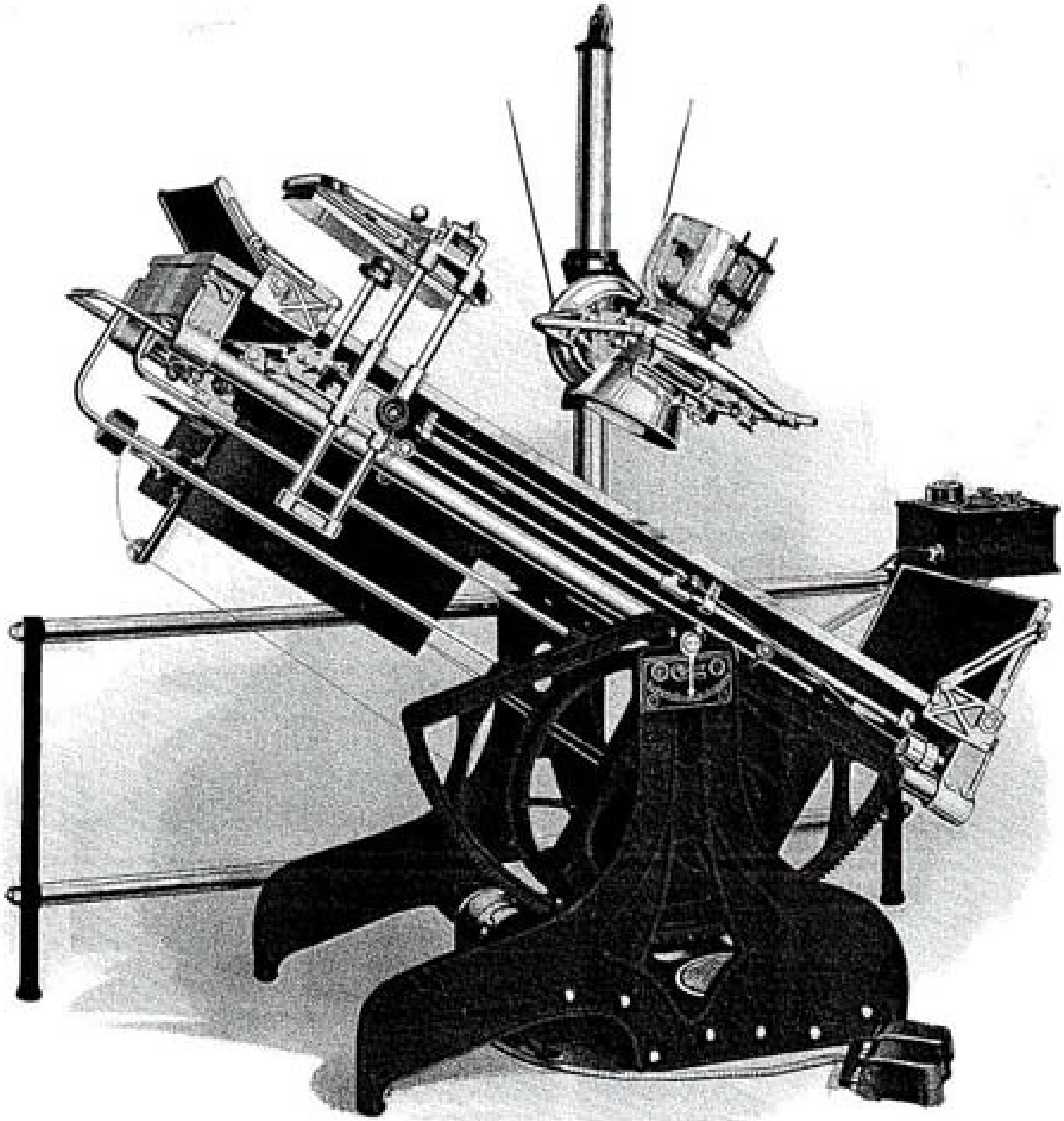
Campbell "Clinix" X-ray Plant

Tube Tilt Table. Motor Driven. Transformer attached to under side of table.
Also furnished with Transformer mounted on top of Tube Stand.
Both High Tension Transformers operated by the one Auto Transformer Control Case.
1 to 30 Milliamperes, 2 to 5 inch Spark Gap.

U. S. Patents
December 19, 1911; April 22, 1913; February 29, 1916;
August 7, 1917. Foreign Patents.
Other Patents Pending.

Cat. No. 2087

Clinix



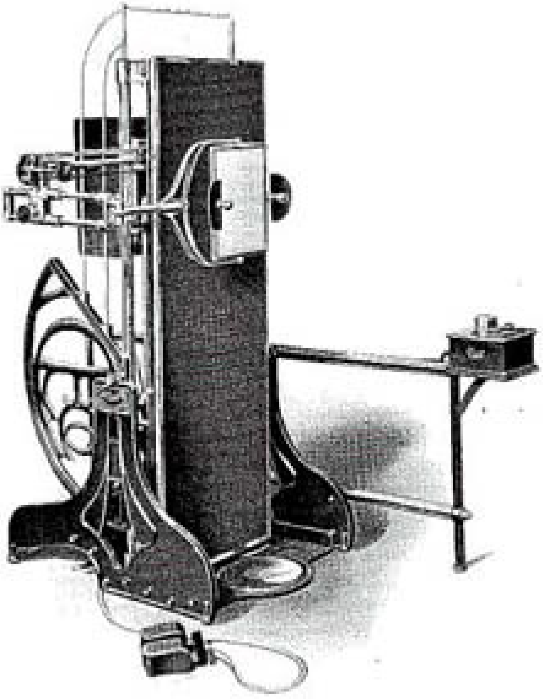
Campbell "Clinix" X-ray Plant

Tube Tilt Table. Motor Driven. Transformer attached to under side of table.
Also furnished with Transformer mounted on top of Tube Stand.
Both High Tension Transformers operated by the one Auto Transformer Control Case.
1 to 30 Milliamperes, 2 to 5-inch Spark Gap.

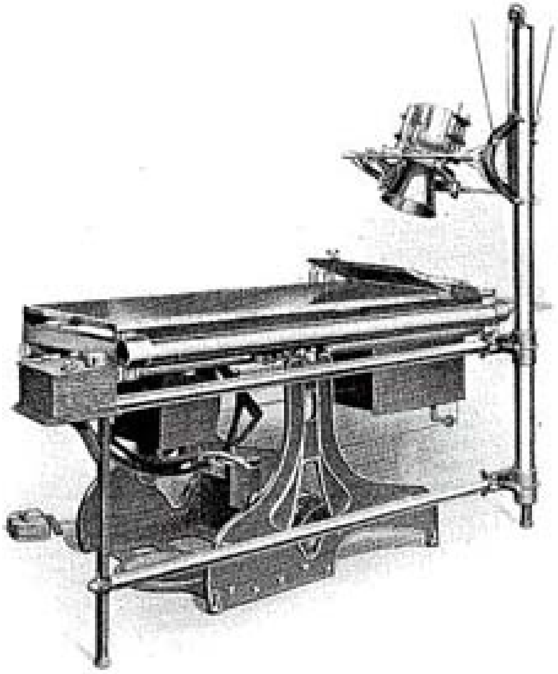
U. S. Patents
December 19, 1911; April 22, 1913; February 29, 1916;
August 7, 1917. Foreign Patents.
Other Patents Pending.

Cat. No. 2087

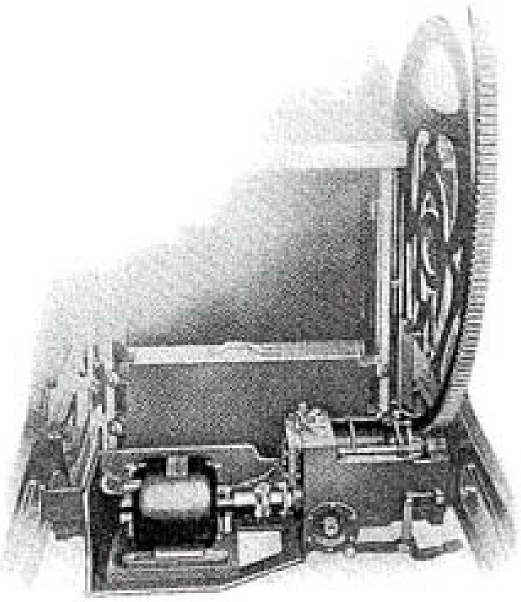
Clinix



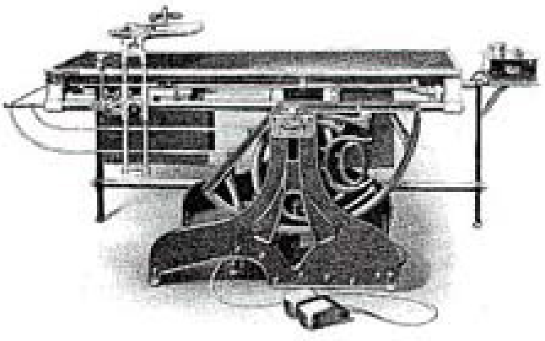
CLINIX IN VERTICAL POSITION



CLINIX IN HORIZONTAL POSITION
Rear view showing Transformer and Connections



CLINIX MOTOR DRIVE AND TRANSMISSION



CLINIX IN HORIZONTAL POSITION
Operating Side

TRANSFORMER
TYPE
TUBE
TILT
TABLE

TRADE MARK

Clinix

X-Ray Plant

Vertical - Horizontal - Angular - Stereo Radiography
Fluoroscopy and Orthodiagraphy—Motor Driven
Self-Excited—1 to 30 Milliamperes—2 to 5-Inch Gap

The Clinix unit is the latest development of the Tube Tilt Table Both are original inventions of Mr. Charles E. Campbell. They have been pronounced by leading Roentgenologists as the greatest attainment in the development of X-ray apparatus and are rapidly revolutionizing X-ray technique.

The Clinix is an X-ray plant, all but the illuminators and dark room. It is a Self Excited, Motor Driven, Stereo Tube Tilt Table with a Combination Screen and Cassette Holder by which radiography as well as fluoroscopy can be done with the tube under the table. The transformer and controls are attached to and form part of the table, thus eliminating the unsightly, annoying and dangerous overhead trolley lines and high tension switch.

The patient when once placed on the Clinix remains there until a complete X-ray examination has been made in the Horizontal, Angular, Trendelenburg and Vertical positions, including fluoroscopy, radiography and orthodiagraphy.

The motor drive is of indescribable value in fluoroscopic examination of the gastrointestinal tract, in accordance with the latest technique for diagnosis of adhesions, the patient being slowly tipped from the vertical to the horizontal and Trendelenburg positions while the operator has his hands free and both the operator and patient are relieved of violent physical exertion.

The transformer attached underneath eliminates the overhead trolley and makes head of the Clinix table accessible.

The Clinix combines in one compact, convenient piece of apparatus of handsome design all the advantages of more than a score of separate pieces of cumbersome and expensive apparatus.

To relocate or rearrange the apparatus of the X-ray laboratory, just move the Clinix, that's all.

The saving in plates and films alone, by accurate localization with floroscopic screen before making radiograph, thus allowing use of the smallest plates or films, would pay a fair return on the investment in entire outfit.

In connection with Eastman Dupli-Tized films and double intensifying screen will do all kinds of radiography.

SPECIFICATIONS.

Dimensions (overall). Length 6′ 8″—Width 32″ (add 3″ for stand track), Height 36″ to table top.

Construction. Entirely of metal except where electrical insulation is needed; a wood top, head and foot boards.

Top. Wood veneer, of careful selection, highest grade and finish. Tested by X-ray to insure a clear examination field. Opens on piano hinge for accessibility of under mechanism.

Examination Field. Extraordinarily large. Size, length 44 inches, width 22 inches. Enough for examination of head to pelvis and shoulder to shoulder without moving patient.

Tube Carriage. Arranged for Coolidge Radiator Bedside Tube (10 or 30 Milliampere) and black Lead Glass Protective Shield enclosed in Bakelite insulation. Mounted on ball bearings. Counterweight runs on ball bearings inside steel tubing on rear side of table. This construction, together with elimination of the heretofore necessary heavy sheet lead covered tube box, makes a wonderfully light weight and wide range tube carriage which moves at the slightest touch.

Stereo Shift. Locks are provided for stereo shift of tube carriage in both directions so that stereo radiographs may be made with the table tube.

Diaphragms. Lead covered, opening enough to cover a 14″ x 17″ screen or plate at a target distance of 21½ inches, adjustable independently or together to horizontal, vertical or square opening.

Filter. Groove under diaphragm opening for insertion of aluminum or other filtering material.

Automatic Plate Changer. For stereo-radiographs with tube above or in front of table. Accommodates up to 14″ x 17″ plates in either direction. Operates with table in

Plant

h are original
Roentgenolo-
ıpidly revolu-

Self Excited,
te Holder by
table. The
ating the un-

plete X-ray
ical positions,

n of the gas-
is, the patient
ons while the
lent physical

and makes

of handsome
and expensive

ve the Clinix,

scopic screen
ld pay a fair

g screen will

Height 36" to

; a wood top,

ay to insure a
er mechanism.
ches. Enough
oving patient.
liampere) and
Mounted on
g on rear side
fore necessary
nd wide range

ctions so that

te at a target
ontal, vertical

ering material.
ront of table.
with table in

either horizontal or vertical positions. Provided with air valve speed adjustment which requires no special adjustment for changing from horizontal to vertical shift. Quickly removable from end of table. A lead field cover is provided for insertion at upper end of table when this plate changer is used and can be put in place while patient is on table. Lower end of table is protected by a permanent sheet lead field cover attached to the iron frame.

Fluoroscopic Screen and Cassette Holder. A combination holder of aluminum with a fluoroscopic screen size 11" x 14" protected by lead glass, on the other side of which a Cassette size 11" x 14" may be quickly attached. Swivels so that plate or film may be protected from X-ray by the lead glass. Holder can be quickly changed so that the fourteen-inch dimension of screen or plate may be used laterally or longitudinally. Adjustable to any distance between 15 inches and 31 inches from target of tube to screen or plate. May be locked to maintain position irrespective of angle of table. Detachable, or may be swung and locked away from table top. Has universal movement so that screen may be tilted at any angle desired, with adjustable friction to maintain position.

Cassettes. Two 17" x 17" aluminum cassettes graduated to adapt to smaller plates. Inserted from side of table while in horizontal, angular or vertical position.

Head and Foot Boards. A head board and foot board are both provided as regular equipment, exactly alike in construction and interchangeable. Adjustable as to distance from head or foot of table. Also adjustable as to angle with relation to surface of table so that either may be used as a seat, stand, shoulder or head rest. May be tilted as a sinus block or at other angles for support of various parts of the body. Quickly adjusted and strong enough to support entire weight of a heavy patient.

Turn Table. Built as a part of the frame, operates on steel ball bearings and so constructed that patient may be easily rotated during fluoroscopic examination in the vertical position.

Graduations. No piece of X-ray apparatus was ever more thoroughly worked out and perfected in the details for convenience of the operator than the Clinix, as is evidenced in part by the graduations of each and every part where desirable to know angle or distance as follows:—Angle of table by degrees from Trendelenburg to vertical,—distance of target to screen in inches,—longitudinal travel of tube in inches,—lateral travel of tube in inches,—opening of diaphragms to cover plates or films of different sizes at various distances.

Luminous Indicators. To facilitate operation in the dark the handles which control movement of screen, diaphragms, and filament regulator are provided with luminous dials. The first five milliampere indications of milliammeters are also luminous.

Motor Drive. Reversible motor of the repulsion type in connection with a transmission, similar to that used in an automobile, geared to a large segment gear. Operates table with patient, up or down by pressure on foot switch. Limit switches stop the motor automatically at the extreme Trendelenburg and vertical positions. A pedal for foot release of motor transmission enables manual adjustment of angle of table if quicker adjustment is needed than motor provides (maximum travel is accomplished by motor in 70 seconds). Automatically locks when pedal is released.

Counter Balance. Table top is so well balanced by distribution of the weight of transformer and by travelling counterweight that it may be tilted by one finger.

Guard Rail. Operating side and head of table are provided with a guard rail to prevent accidental contact with tube connections. Rear side of table is protected by tracks for tube stand and lower end by distance and the fact that secondary terminals are mounted on side of transformer facing toward head of table.

Transformer (High Tension). Secondary 65,000 volts. Closed core, non-fluid insulation, hardwood locked corner case. Sufficient capacity to deliver 1 to 30 milliamperes to X-ray tube with 2" to 5" spark gap.

Transformer (Filament). In same case with high tension transformer.

Controls. Control Case attached to end of table, provided with—auto transformer, voltmeter, milliammeter, auto transformer switch (adjusts line voltage to that for which apparatus is made) main switch, double throw tube switch and potential compensator switch (provides 3 different current changes and simultaneously maintains voltage or penetrative value of the X-ray). The high tension transformer attached to table is provided with a milliammeter and a filament regulator conveniently visible and operable from front of table independent of auto-transformer control case.

Main switch is operated by a pull cord extending entire length of table so that current may be turned on or off at any position, during examination.

Reels. Self-winding. Connect from transformer secondary terminals direct to X-ray tube. Take the place of overhead trolley lines with their attendant inconvenience and danger.

Foot Switches. Positive, quick-action, prevents arcing and burning of contacts.

Current Required. Operates on alternating current of 100 to 120 volts, 50 to 60 cycle, 6 to 35 amperes, according to current used in tube. Also on direct current by addition of a rotary converter and transformer which may be installed in another room. To operate tube with ten milliamperes requires a one kilowatt rotary converter. Thirty milliamperes requires a four kilowatt converter.

Finish. The finish of frame and top is mahogany. Other parts, polished aluminum and nickel plate.

Tube Stand No. 6. For radiography and therapy with tube above table. (**When using tube in stand a separate high tension transformer must be used.**) The No. 6 Tube Stand possesses the following exclusive features in addition to all the usual advantages. Entirely controlled from operating side of table by a single lock without reaching over. Overhang 26 inches, allows radiography of either shoulder without moving patient. Friction disc holds tube safely at any angle. Stereo shift and tilt at any point of the circumference. Slight underhang. Automatic safety lock in case cable breaks. High grade ball bearings throughout. The best of machine work. Furnished with lead glass tube shield and diaphragm, complete, ready to attach to tracks of **Clinix** table.

Extra High Tension Transformer for Tube Stand, 1 to 30 milliamperes, 3" to 5" gap, with attachments for fastening to No. 6 Tube Stand, to operate tube in stand. Travels with stand. Equipped with high-tension terminals, cord reels, filament regulator and connections to Control Case. Operated by same control which operates the table tube. Double throw switch on Control Case makes it impossible to accidentally turn current on both tubes at same time. (Sold only for use with "Clinix" Table.)

Tube. Self-rectifying, Coolidge Radiator Bedside Type, ten or thirty milliampere.

Patents. This apparatus is protected by United States patents, issued Dec. 19, 1911, April 22, 1912, Feb. 29, 1916 and Aug. 7, 1917. Also by foreign patents. Other patents pending.

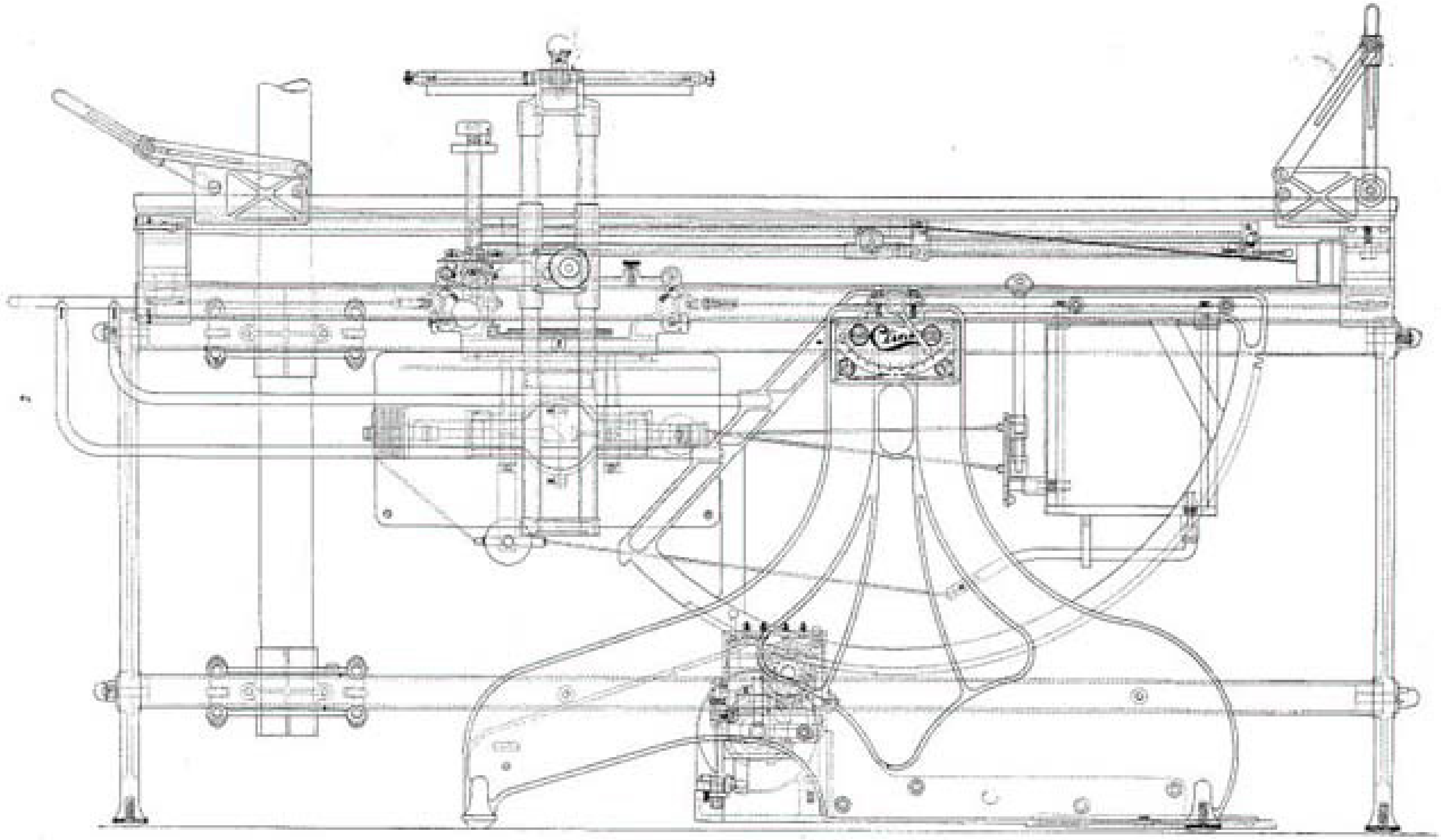
PRICES

	Catalog Number Complete Assembly	PRICE	
		Per Item	Total Complete Assembly
Campbell Clinix Tube Tilt Table with terminals at upper end arranged to excite tube under table from an interrupterless or other outside transformer—with Automatic Plate Changer, 11 x 14 Fluoroscopic Screen and Holder, 2—17 x 17 Cassettes, Head and Foot Boards, Cord Reels, etc., boxed ready for shipment. F. O. B. Detroit	2095	$1550.00	$1550.00
Motor Drive and Foot Switches (Cat. 2108)	2094	100.00	1650.00
High Tension Transformer attached under table (Cat. 2111, $450) with Control Case (Cat. 2112, $100)	2086	550.00	2200.00
Number 6 Tube Stand (Cat. 1013)	2087	300.00	2500.00
Extra High Tension Transformer for Tube Stand with mountings (Cat. 2093)........................	2100	450.00	2950.00
Two Coolidge Radiator X-ray Tubes (Cat 1270, $125 each)..	2110	250.00	3200.00
Complete Clinix X-ray Plant (Catalog No. 2110) Code word Clinix	**2110**	**$3200.00**	**$3200.00**

NOTE:—This latter combination leaves nothing to be desired except the dark room equipment, illuminators and a few small accessories.

If supply is NOT alternating current of 100 to 120 Volt, 50 to 60 Cycle, one of the following must be used. May be installed in separate room or in basement if desired.

Cat. No. 1502 *Rotary Converter and Transformer for Direct Current,* (10 *milliamperes in Tube*) 110 *Volt*	$225.00
Cat. No. 2115 *Rotary Converter and Transformer for Direct Current,* (10 *milliamperes in Tube*) 220 *Volt*	275.00
Cat. No. 2113 *Rotary Converter and Transformer for Direct Current,* 4 *Kilowatt* (30 *milliamperes in Tube*) 110 *or* 220 *Volt*	525.00
Cat. No. 2114 *Step-Down Transformer* 220 *Volt or* 440 *Volt,* 60 *Cycle*..........	75.00

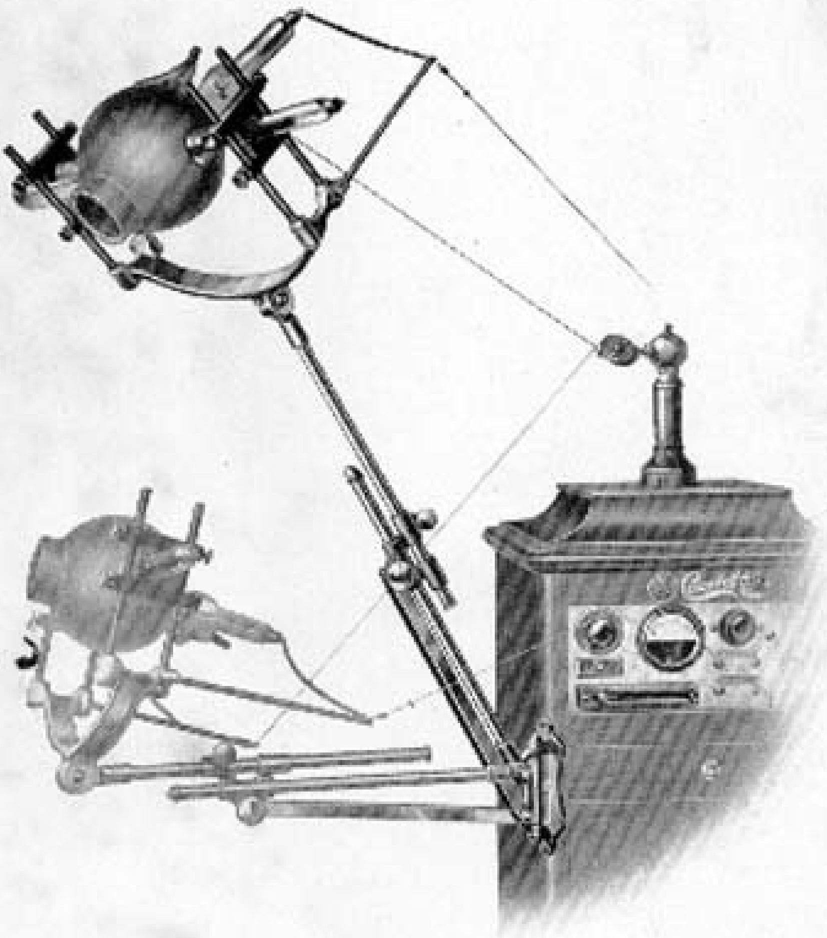


CAMPBELL "CLINIX" X-RAY PLANT

Line drawing, illustrating in detail, mechanical construction.

Campbell

3703

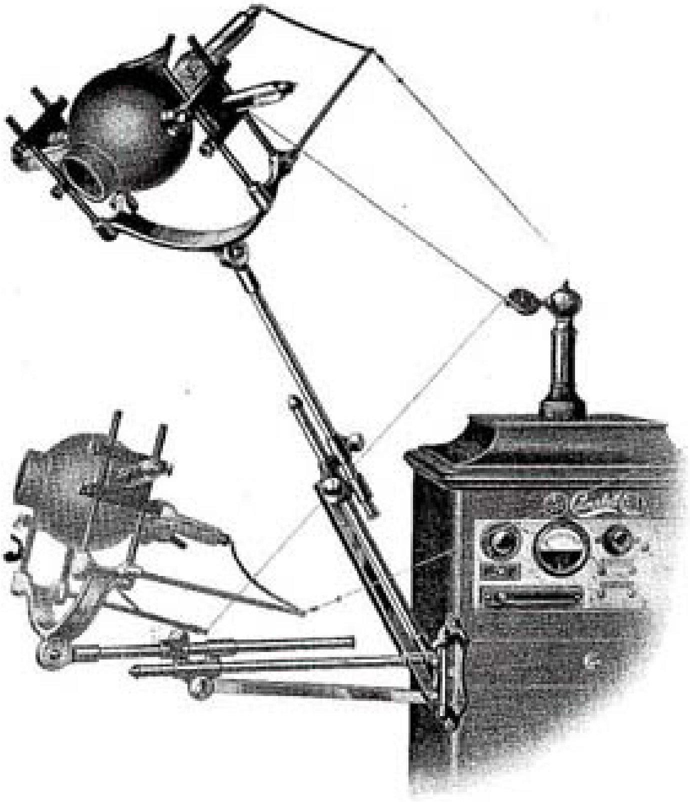


Campbell Dental Bracket Tube Holder

Cat. No. 2006

Campbell

3703



Campbell Dental Bracket Tube Holder

Cat. No. 2006

Dental Bracket Tube Holder, a most convenient and universally adjustable X-ray tube holder made for the use of the dentist. Illustration shows its ready adaptability to positions used in dental radiography, in making films of upper and lower teeth. Is usually hinged to corner of cabinet. May be adjusted to many positions without the necessity of adjusting thumb screws. Is constructed of metal; all parts are of neat design, and finely finished. Readily accommodates 5", 6" or 7" tubes with rubber protective shields.

June 7, 1927. **C. E. CAMPBELL** 1,631,718

CABINET

Original Filed June 14, 1920

Fig.1

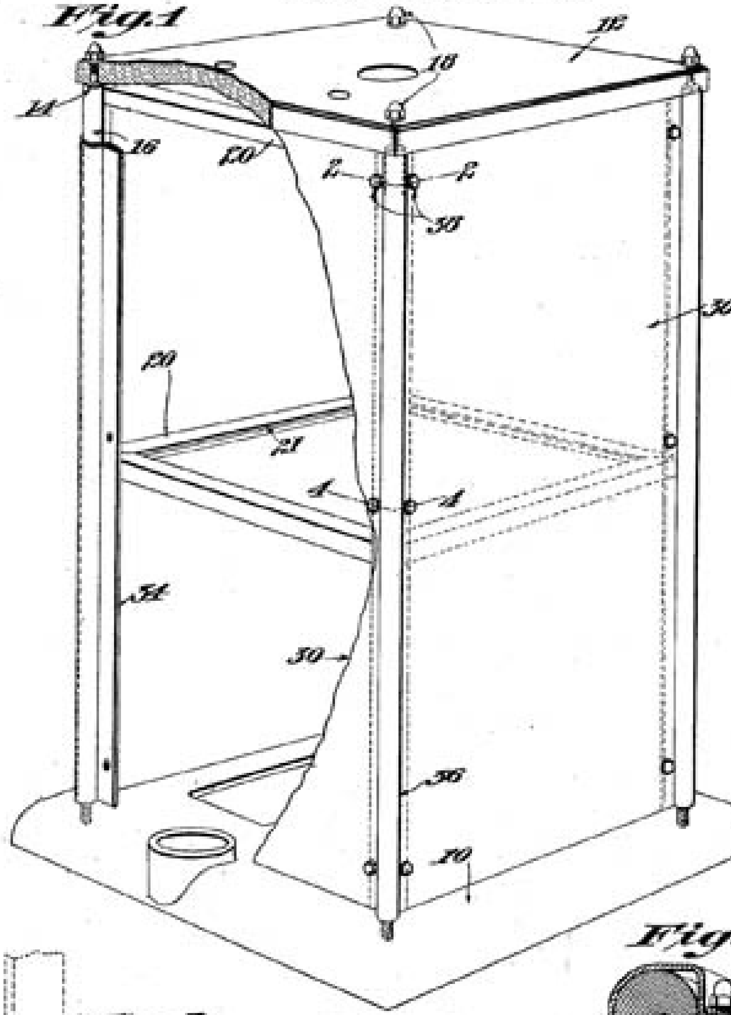

18
12
14
16
120
2
2
38
30
130
21
4
4
34
30
36
10

Fig.3

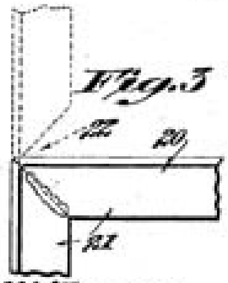


Fig.2

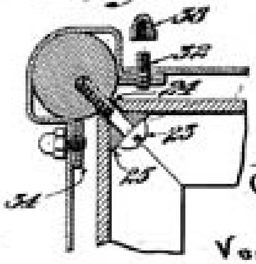
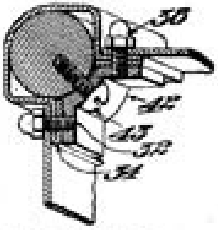

38
32
24
25
25
34

Fig.4


38
42
43
32
34

Witness

Inventor

Charles E. Campbell
by his Attorneys
Von Luven Fish & Hildreth

Patented June 7, 1927. **1,631,718**

UNITED STATES PATENT OFFICE.

CHARLES EDWARD CAMPBELL, OF LYNN, MASSACHUSETTS, ASSIGNOR TO CAMPBELL ELECTRIC COMPANY, OF LYNN, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

CABINET.

Application filed June 14, 1920, Serial No. 388,777. Renewed May 1, 1926.

This invention relates to a cabinet for X-ray units and the like.

The object of the invention is to produce a cabinet for X-ray units and the like of improved construction, which may be manufactured economically, assembled easily, is strong and durable, and which presents a very attractive and pleasing appearance.

To these ends, the invention consists in the cabinet hereinafter described and claimed.

In the drawing illustrating the preferred embodiment of the invention, Figure 1 is a perspective of the improved cabinet with a portion broken away; Fig. 2 is a sectional detail of a corner of the cabinet taken on the line 2—2 of Fig. 1; Fig. 3 is a detail illustrating the manner of forming the corner joint of the angle iron support; and Fig. 4 is a detail on the line 4—4 of Fig. 1, showing the reenforcing plates for the corner moldings.

Referring to the drawing, the cabinet comprises a relatively heavy base 10 and a top 12, preferably of marble. The top 12 rests upon shoulders 14 formed upon the upper ends of four corner posts 16. The corner posts 16 are provided with reduced lower ends which are threaded and screwed into threaded holes in the base 10. The top 12 is secured in place by nuts 18 screwed onto reduced upper ends of the posts 16, which are suitably threaded and extended through holes in the top 12. The base 10, top 12 and corner posts 16 constitute the frame of the cabinet.

Preformed supports 20 are secured in place within the cabinet, one at the top and one at a point intermediate the top 12 and base 10. Each of the supports 20 comprises an open rectangular angle iron frame secured within the cabinet in position with one flange 21 horizontal. The supports 20 are secured to the corner posts 16 by screws 23 (see Fig. 2) extended through holes 24 in the corners of the vertical flange of the angle iron frame. Corner blocks 25 are employed to afford bearings for the heads of the screws 23 and to assist in clamping the supports to the corner posts in the manner illustrated in Fig. 2. The supports 20 are each formed from a single angle iron bar bent into rectangular shape. Triangular portions 22 of the flange 21 are cut away in order that when the bar is bent into rectangular shape, flush joints may be secured at three of the corners. The ends of the flange 21 are bevelled off to provide a flush joint at the fourth corner and a unitary structure is secured by spot welding the bevelled ends of the flange.

The sides of the cabinet are closed by sheet metal panels 30. The panels 30 are provided with a plurality of holes near their side edges located so as to cooperate with threaded studs 32 fixed in and projecting from side flanges 34 of corner moldings 36. The panels 30 are held in place by nuts 38 screwed onto the ends of the studs 32. The corner moldings 36 are of heavy gage sheet metal and are stamped into the form illustrated in section in Fig. 2. The corner moldings may have any desired shape in cross section to enhance the appearance of the cabinet at the corners. The corner moldings partially enclose the corner posts 16 and are frictionally secured thereto. The ends of the side flanges 34 of the corner moldings are folded under to afford sufficient thickness of metal to retain the studs 32 and to act as stiffening strips for the support of the panels 30. In some instances it may be desirable to reenforce the corner moldings and for this purpose plates 42 are secured to the corner posts by screws 43 and the studs 32 are extended through the side flanges 34 of the corner molding and into the plates 42.

In assembling the cabinet, the corner posts 16 are screwed into the base 10. The preformed supports 20 are then secured to the corner posts and thereafter the four corner moldings 36 are slipped into place over the upper ends of the corner posts. The top 12 is then dropped over the upper reduced ends of the corner posts and secured thereto by the nuts 18. The panels 30 are then secured to the side flanges of the corner moldings, thus completing the cabinet. It will be observed that the finished cabinet presents the impression of great strength due to the massive appearance of the corner moldings and the weight thereof is maintained at a minimum.

Having thus described the invention, what is claimed is:

1. A cabinet comprising a base, corner posts secured to the base, sheet metal corner moldings enclosing the corner posts provided with side flanges, a top supported upon and secured to the corner posts, an

angle iron support within the cabinet secured to the corner posts, and panels secured to the side flanges of the corner moldings, the support comprising an angle iron bar bent to form an open rectangular frame and having its free ends spot welded.

2. A cabinet comprising a base, corner posts secured to the base, sheet metal corner moldings resting upon the base and enclosing the posts provided with side flanges, threaded studs affixed in and projecting from the side flanges, a top supported upon and secured to the corner posts, panels provided with a plurality of holes through which the threaded studs are extended, and nuts on said studs for clamping the panels to the side flanges.

CHARLES EDWARD CAMPBELL.

C. E. CAMPBELL.

SPARK GAP.

APPLICATION FILED APR. 24, 1916.

1,231,489. Patented June 26, 1917.

3 SHEETS—SHEET 1.

Fig.1

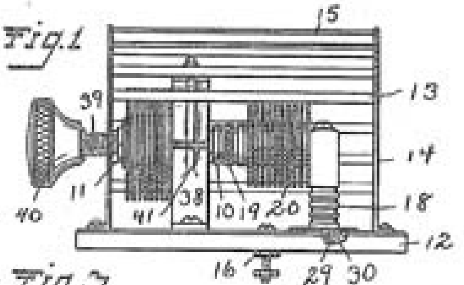

15
13
39
14
18
11
38
41
10
19
20
40
12
16
29
30

Fig.2

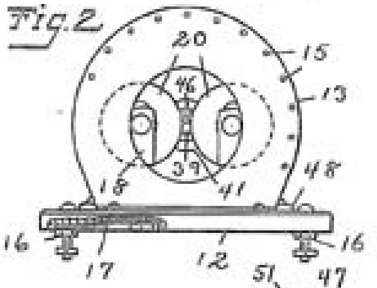

20
15
46
13
48
18
39
41
16
17
12
16

Fig.3

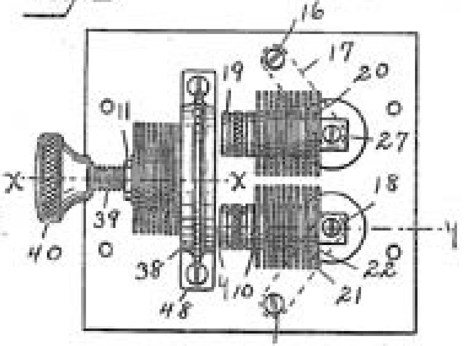

16
17
19
20
11
27
X
X
18
39
4
40
38
22
48
4
10
21
16

Fig.4

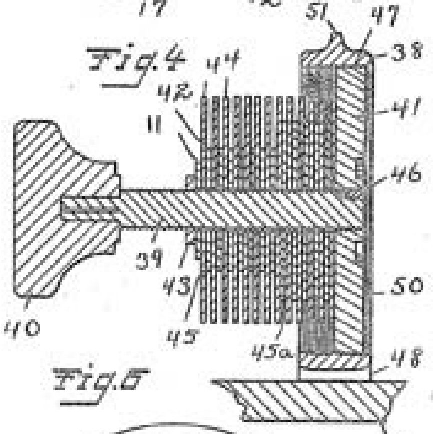

51
47
38
44
42
41
11
46
39
50
43
45
45a
40
48
12

Fig.5

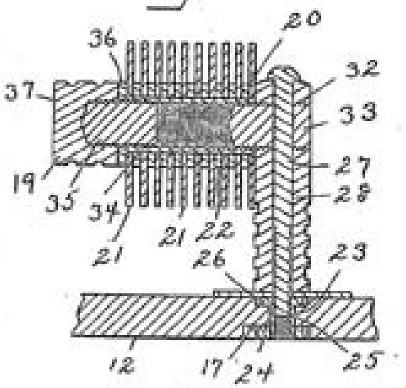

36
20
32
37
33
27
19
28
35
34
21
21
22
21
26
23
12
17
24
25

Fig.6

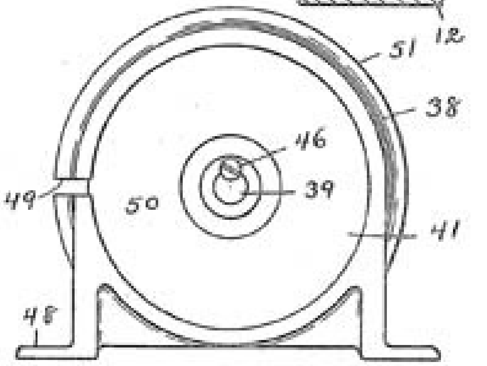
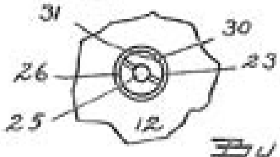

51
38
46
39
49
50
41
48

Fig.7


31
30
26
23
25
12

Inventor:

Charles E. Campbell.

By Louis W. Schmidt

Atty.

C. E. CAMPBELL.
SPARK GAP.
APPLICATION FILED APR. 24, 1916.

1,231,489.

Patented June 26, 1917.
3 SHEETS—SHEET 2.

Fig. 8

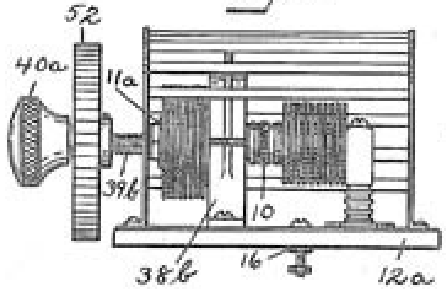

52
40a
11a
39b
10
38b
16
12a

Fig. 9

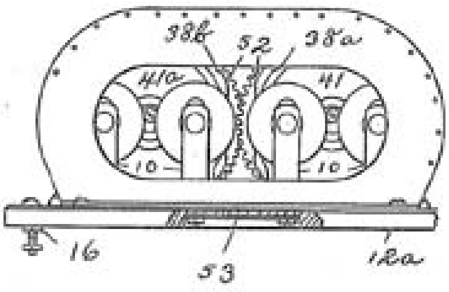

38b
52
38a
41a
41
10
10
16
53
12a

Fig. 10

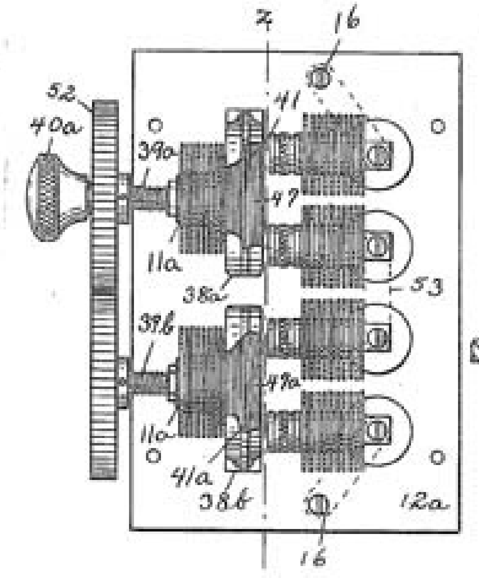

z
16
52
40a
39a
41
47
11a
38a
53
39b
47a
11a
41a
38b
12a
16
z

Fig. 12

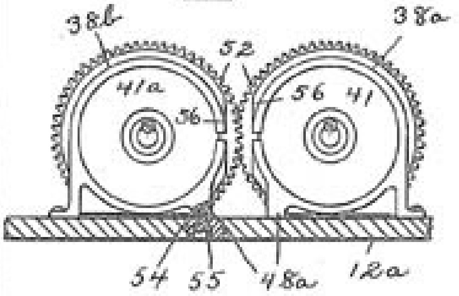
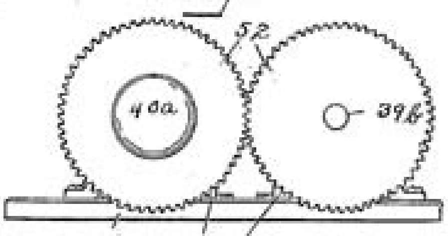

38b
52
38a
41a
56
41
56
54
55
48a
12a

Fig. 11


52
40a
39b
12a
48a

Inventor:
Charles E. Campbell.
By Louis M. Schmidt
Atty.

C. E. CAMPBELL.
SPARK GAP.
APPLICATION FILED APR. 24, 1916.

1,231,489. Patented June 26, 1917.
3 SHEETS—SHEET 3.

Fig.13

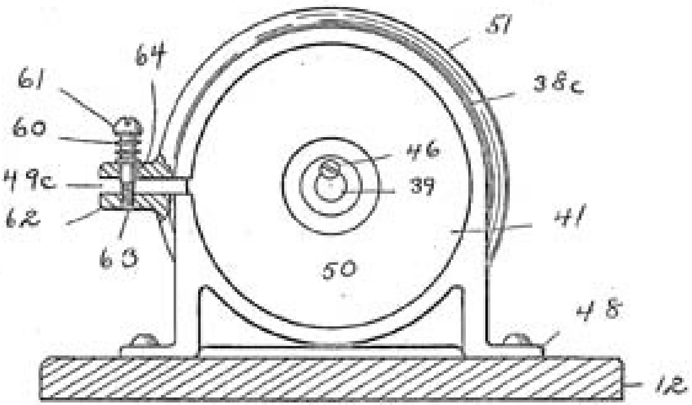
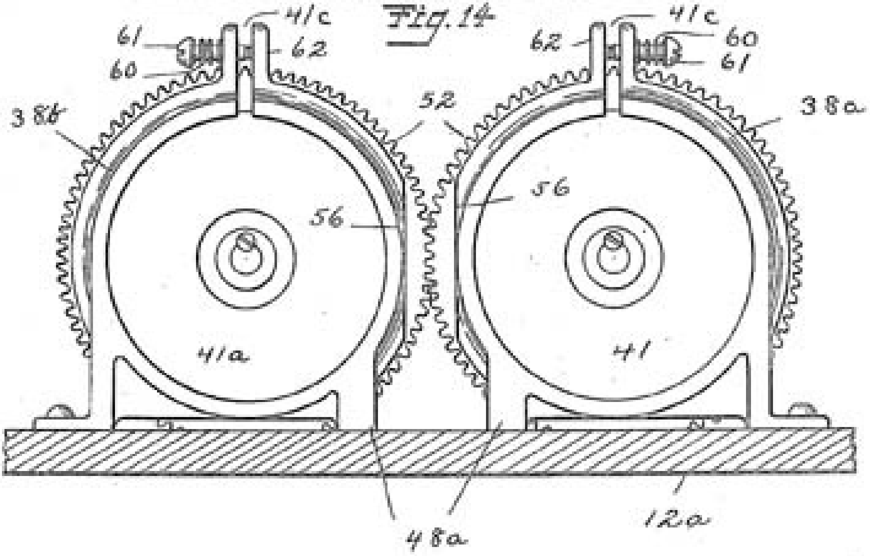

61
64
60
49c
62
63
51
38c
46
39
41
50
48
12

Fig.14


61
60
41c
62
38b
52
56
41a
62
41c
60
61
38a
56
41
48a
12a

Inventor:
Charles E. Campbell.
By Louis M. Schmidt.
Atty.

UNITED STATES PATENT OFFICE.

CHARLES E. CAMPBELL, OF LYNN, MASSACHUSETTS.

SPARK-GAP.

1,231,489. Specification of Letters Patent. **Patented June 26, 1917.**

Application filed April 24, 1916. Serial No. 93,195.

To all whom it may concern:

Be it known that I, Charles E. Campbell, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Spark-Gaps, of which the following is a specification.

My invention relates to improvements in spark gaps, and the object of my improvement is simplicity and economy in construction and convenience and efficiency in use.

In the accompanying drawing:—

Figure 1 is a side elevation of my improved spark gap.

Fig. 2 is a front end elevation of the same.

Fig. 3 is a plan view of the same with the guard cage removed.

Fig. 4 is a sectional view, on an enlarged scale, on the line *x x* of Fig. 3.

Fig. 5 is a similar view on the line *y y* of Fig. 3.

Fig. 6 is a front elevation of the movable member and the frame.

Fig. 7 is a fragmentary plan view of the base, showing the hollow stud for supporting the post.

Fig. 8 is a side elevation on the same scale as Fig. 1 of a form of improved spark gap showing a double pair of gaps with the moving parts connected by gearing.

Fig. 9 is an end elevation of the same.

Fig. 10 is a plan view of the same, the cage being omitted.

Fig. 11 is a rear elevation of the movable portion and adjacent parts.

Fig. 12 is a sectional view on the line *z z* of Fig. 10.

Fig. 13 is an end elevation, on an enlarged scale, of a modified form of frame and adjacent parts, showing a spring steadying device across the break in the annular body portion.

Fig. 14 shows an adaptation of the same feature to a spark gap of the double gap construction.

My improved spark gap comprises a pair of stationary contacts or electrodes 10 that operate in coöperation with a movable contact 11, all of which are mounted on a suitable base 12.

A cage-like guard 13 may be provided, also mounted on the base 12, inclosing the contacts 10 and 11, and composed of a pair of end plates 14 interconnected adjacent the periphery by a plurality of longitudinal bars 15.

A pair of electric line terminals 16 suitably positioned on the base 12 are connected by connecting strips 17 underneath the said base 12, one to each of the supporting posts 18 of the fixed contacts 10.

Considering the fixed contacts 10, these comprise each the post 18, extending upwardly from the base 12, and supporting by its upper end and on the inner side thereof, an inwardly directed composite member, composed on the exterior of the fixed contact proper or contact piece 19 at the extreme inner, free end and intermediate the said contact piece 19 and the supporting post 18 a filling of washers forming a heat radiating member 20. The said radiating member 20 comprises a set of radially positioned washers having alternately a large washer 21 and a smaller washer 22, a plurality of such washers being used sufficient to provide the desired heat radiating effect.

As a support for the post 18 on the base 12 and providing electric connection therewith I provide the hollow stud 23 positioned in a suitable hole in the base 12, and secured by the nut 24, the latter being on the under side of the base 12, and bearing against the conductor strip 17.

The bore 25 of the stud 23 is screw threaded, and the head portion 26 is preferably housed in a suitable recess on the upper side of the base 12.

Thus the hollow stud 23 is fixedly secured to the base 12 and a permanent connection therewith is made leading to the terminal 16, and means are provided in the threaded bore 25 for receiving the holding screw 27 that holds the post 18 in position.

The body portion of the post 18 is hollow, having a longitudinal bore 28 that is a fit for the screw 27. The said body portion has a square cross section, and on the lower end has a downwardly projecting positioning pin 29 that engages with a suitable hole 30 in the base 12. In drilling into the base 12 to form the hole 30 I prefer to cut into the head 26 of the stud 23 to form a notch 31 for engaging with the said positioning pin 29.

The holding screw 27 extends entirely through the post 18, the head being engaged with the upper end thereof, and the lower end being screwed into the threaded bore 25 of the stud 23 and serves to hold the post 18 in place, the positioning pin 29 determining the angular position thereof.

At the upper end of the post 18 there is a transverse bore 32, having a screw thread in which is screwed the outer end of the solid stud 33. The bore 28 in the post 18 extends through the said solid stud 33, so that the holding screw 27, which is positioned in the said bore extends across the said stud 33 and serves to hold the same positively in the said transverse bore 32.

The other end of the solid stud 33 extends inwardly from the post 18 and serves as the support for the composite member mentioned, being directly connected to the outer end of the radiating member 20.

The said radiating member 20 which as stated above comprises on the exterior the washers 21 and 22, is a unitary structure. The same consists of a core 34 in the form of a hollow sleeve, internally threaded, the washers 21 and 22 being mounted on the exterior thereof, and the ends of the core 34 being headed over against the end washers, the holes in the end washers being preferably tapered on the outer sides to receive the headed or turned ends and to permit of finishing the same flush with the outer faces of the said end washers. This permits the outer end washer 21 to bear against the opposed face of the post 18.

The threaded core 34 is engaged by the outer end with the overhanging end of the solid stud 33 and by the other, inner end is engaged with another solid stud 35, which latter serves as a connection and support for the contact proper 19, which is in the form of a cap nut. A washer 36 may be interposed between the contact nut 19 and the radiating member 20.

The outer contact or sparking faces 37 of the two contact nuts 19 are faced off in a common plane, at right angles to the axes, after the parts have been adjusted and secured in their final positions.

It will be noted that the construction of the fixed contact structure is such that the several parts can be readily removed, beginning with the contact nut 19 and following through the successive parts, even to dismantling the entire post structure, and the latter may be effected without disturbing the electrical connections leading to the lower ends of the post 18.

The movable contact structure comprises the movable contact member or adjusting part 11 and the frame or casing 38 by which the same is adjustably supported by means of screw thread engagement.

The said adjusting part 11 comprises a solid core 39 in the form of an elongated member having a screw thread on the periphery, on which are mounted a handle 40 at the outer end, a dial 41 at the other end in the form of a relatively large disk, having a screw thread on the periphery 47, and adjacent and opposed to the said dial 41 and extending an appreciable distance along the core toward the handle 40, a set of radiating washers, designated generally by the character 42, held in place by a nut 43. The said set of washers comprises large washers 44 alternating with smaller washers.

For the smaller washers I prefer to use two sizes to produce a stepped effect, those on the side toward the nut 43, designated by the character 45, being of the smaller size, and a plurality on the side toward the disk 41, designated by the character 45ᵃ, being more nearly of the size of the large size washers 44 with which they alternate, as shown.

The construction described provides a superior backing for the disk 41, and extra heat conducting material adjacent the same, and serves to distribute the heat better along the heat radiating structure than would be the case if the intermediate filling washers were all of the smaller size.

A disk 41 has a screw threaded hole in the middle by which the same is screwed on the end of the core 39 and a longitudinally directed screw 46 serves as a key and general locking means therefor, the same being engaged with a threaded hole at the junction of the periphery of the core 34 and the opposed wall of the hole in the disk 41.

The disk 41 is of appreciable thickness so that a plurality of threads will be provided on the periphery 47, which threads are preferably relatively fine, being of short pitch which permits of relatively fine and accurate adjustment.

The frame 38 is in the form of a single casting having an annular body portion and feet 48 by which the same is secured to the base 12. The interior of the said body portion is threaded to fit the threaded periphery 47 of the disk 41, and the same is of sufficient length to provide for the desired range of adjustment.

Furthermore, the said body portion is provided with a radial slit 49 in the side wall provided by cutting away a small portion of the said side wall, as shown.

The purpose of the slit or slot 49 is to provide a slight amount of give or leeway responsive to slight changes in dimension of the parts, such as may follow from heating of the disk 41 and connected parts, and thus to insure free turning movement of the disk 41 under all working conditions. While the frame is made of cast material, the same has sufficient resiliency for the conditions mentioned.

The inner contact face of the disk 41, which is opposed to the fixed contact faces 37, is faced off radially concentric with the axis of the threaded periphery in parallelism with the plane of the said fixed contact faces 37.

Thus by turning the handle 40 there will be a true shortening or lengthening of the sparking distance between the contact or sparking face 50 of the disk 41 and the faces 37 of the stationary contacts.

The diameter of the disk 41 as shown is made equal to the distance across the stationary contacts 19. This large diameter of the disk, and the fact that it is held by the outer circumference, insures a maximum of accuracy of adjustment on both gaps.

The fact that only one member is used to change the length of the two gaps contributes to the accuracy of adjustment obtainable.

Furthermore the heat conduction away from the disk 41 is facilitated by the large diameter thereof and this makes contact by the periphery with the frame by which it is supported, so that the frame may be effective in conducting away excess of heat.

Furthermore, the frame 38 may be provided with a radial rib 51 on the periphery to effectively radiate heat.

The base 12 may be made of marble, slate, or other suitable insulating material.

The line-terminals as described lead to the fixed contacts and the movable contact, which is mounted in a base of insulating material and without direct electrical connections, serves to electrically bridge the fixed contacts, forming a gap with each of the same.

The two gaps are accordingly operatively in series, and when any adjustment is effected the length of both gaps is changed simultaneously, the effect of a movement of the movable gap being doubled in the corresponding change in the effective length of the double gap.

Furthermore, such change is particularly accurate and positive for the two individual gaps because of the manner of construction and arrangement described.

The apparatus described is used in connection with X-ray apparatus, and I find there are advantages in using the same in having a series of small gaps in lieu of one longer gap, as a higher voltage is required to jump the gaps, and after the jump has been made, there is less resistance, so that a "fatter" spark or spark of greater amperage is obtained.

The arrangement described of having a unit consisting of a single movable element bridging a pair of stationary contacts or electrodes may be amplified by providing a plurality of such units, each having its individual movable element bridging a pair of stationary contacts, and the several movable elements being connected by gearing and operated in unison by means of a single handle.

Thus in Figs. 8, 9, and 10 is shown a pair of such units, mounted on a single base 12^{a}, the two movable contacts or electrodes 11^{a} being interconnected by a pair of gear wheels 52 mounted on the respective shafts 39^{a} and 39^{b}.

One of the shafts, the rear shaft 39^{a} shown in Fig. 10, is provided with the handle 40^{a}, the other shaft 39^{b} being without a handle.

The gears 52 are made of insulating material such as bakelite or a built up material composed largely of asbestos or mica.

The rear or handle shaft 39^{a} differs from the shaft 39 shown in Figs. 1 and 4 only in the provision for mounting the gear 52, the thread on the periphery being right handed.

In the case of the front shaft 39^{b}, the same differs from the rear shaft 39^{a} in the omission of the handle.

The rear disk or dial 41, mounted on the rear shaft 39^{a}, and engaged with the rear frame 38^{a}, and which constitutes the rear contact proper, is like the disk 41 shown in Figs. 1, 4 and 5, having a right handed screw thread 47.

In the case of the front disk 41^{a} and front frame 38^{b} however the screw thread 47^{a} is left handed.

By having the threads 47 and 47^{a} different as described the travel of the two movable contacts 11^{a} will be similar, when the handle 40^{a} is turned, so that both will travel toward or away from the fixed contacts 10 according to the direction the handle is turned.

The outer fixed contacts 10 are connected to the line terminals 16 on the base 12^{a} and the two inner fixed contacts 10 are interconnected in some suitable manner, as by a connecting strip 53 as shown in Fig. 8.

The frames 38^{a} and 38^{b} that support the disk portions of the movable contacts may have the annular body portion slabbed off as shown at 56 on the sides that are opposed to one another to provide increased air space between the frames.

Also the laterally projecting feet 48 are omitted on the opposed sides, and in lieu thereof on each frame there is provided a foot 48^{a} positioned inwardly appreciably, to increase the leakage distance along the base 12^{a}, and having a threaded hole 54 for receiving a screw 55 inserted through the base 12^{a} from the underside.

In Fig. 13, the frame 38^{c} is provided with a steadying device across the radial slit 49^{a} in the form of a spring 60, mounted on a screw 61, and supported by ears 62 extending outwardly from the frame body, one on each side of the slit. The hole 63 in the lower ear 62 is threaded and the hole 64 in the upper ear 62 is a fit for the body of the screw 61, the spring being positioned between the upper ear 62 and the head of the screw.

In Fig. 14 is shown an adaptation of the feature of the spring steadying device shown in the single unit construction of Fig. 13 to the duplex construction. In this construction the radial slit between the ears 62, designated as 41ᶜ, is at the top of the frames 38ᵃ and 38ᵇ, the screw 61 and spring 60 being arranged as in Fig. 13, the screw heads being directed outwardly in each case so as to be readily accessible.

I claim as my invention:—

1. A spark gap comprising a pair of stationary electrodes and an adjustable electrode coöperating therewith, the said adjustable electrode being in the form of a disk, rotatively mounted, the said fixed electrodes being positioned side by side and opposed to one face of the said disk, and the supporting means for the said adjustable electrode comprising a frame that is engaged with the periphery of the said disk.

2. A spark gap comprising a pair of stationary electrodes and an adjustable electrode coöperating therewith, the said adjustable electrode being in the form of a disk, rotatively mounted, the said fixed electrodes being positioned side by side and opposed to one face of the said disk, the supporting means for the said adjustable electrode comprising a frame that is engaged with the periphery of the said disk, and the said frame having screw thread connection with the said periphery.

3. A spark gap comprising a pair of stationary electrodes positioned side by side and in spaced relation and a third electrode in the form of a disk having one face opposed to the said stationary electrodes, and a frame serving as a support for the said disk and having screw thread connection with the periphery thereof.

4. In a spark gap device, a base, electrodes supported from the said base comprising a pair of stationary electrodes and an adjustable electrode, the said stationary electrodes comprising each a terminal face at one end, a supporting post at the other end, and intermediate the said ends having a body portion provided with heat radiating disks, and the said adjustable electrode comprising a disk at one end that serves as the electrode proper and that is engaged with supporting means, and having outwardly from the said disk a stem that is provided with heat radiating disks.

5. In a spark gap device, an adjustable electrode in the form of a disk, and a frame supporting the said disk, the said frame comprising an annular body portion having screw thread connection with the periphery of the said disk, and the said frame having a radial slot extending across the side wall of the said body portion.

6. In combination in a spark gap, having an adjustable electrode having a cylindrical periphery provided with a screw thread and a frame having a bore provided with a screw thread for coöperating with the said peripheral screw thread, and the wall of the said frame inclosing the said electrode contact being interrupted by a radial slot, whereby free coöperation of the parts is permitted under slightly varying relative dimensions thereof.

7. In a spark gap device, an adjustable electrode in the form of a disk, and a supporting frame, the said disk having a cylindrical periphery provided with a screw thread, the said frame comprising a cylindrical body portion having a bore provided with a screw thread for engaging with the said periphery of the disk, and the said frame being provided on the periphery with a radial, heat radiating rib.

8. In a spark gap comprising a base and a line terminal and a stationary electrode mounted thereon, a conductor strip connecting the said line terminal and fixed electrode, and a hollow stud fixedly mounted on the said base, connected to the said strip, and having the bore portion threaded suitably to receive supporting means for supporting the said fixed electrode.

9. In a spark gap, a base, an interiorly threaded hollow stud fixedly secured to the said base, a stationary electrode comprising a post and an electrode proper mounted on one side thereof, a solid stud serving as the support for the said electrode proper and extending through the said post, and a holding screw extending longitudinally through the said post and pasing through the said solid stud and engaged with the said hollow stud.

10. In a spark gap, a stationary electrode supported from a base and comprising a post and having on one side of the said post a radiating member and an electrode proper, the said radiating member being in the form of a unitary structure, comprising a sleeve having a screw thread on the interior, a set of washers mounted on the exterior of the said sleeve, and the ends of the said sleeve headed over to hold the said washers in place, a solid stud screwed into the ends of the said sleeve and having projecting portions extending beyond the same at each end, one of the said projecting portions being engaged with the said post, and the said electrode proper being mounted on the other of the the said projecting portions.

11. A spark gap comprising a plurality of units mounted on a single base, each of the said units being composed of a pair of fixed electrodes and a movable electrode operatively bridging the said fixed electrodes, and common means for simultaneously operating all of the said movable electrodes so as to move them either toward or away from the pairs of fixed electrodes which they serve to bridge.

12. A spark gap comprising a pair of units mounted on a single base, each of the said units being composed of a pair of fixed

electrodes and a movable electrode operatively bridging the said fixed electrodes, the said movable electrodes being mounted so as to adjust the gap by a rotative movement, and gearing serving to interconnect the said movable electrodes.

13. A spark gap comprising a pair of units mounted on a single base, each of the said units being composed of a pair of fixed electrodes and a movable electrode operatively bridging the said fixed electrodes, threaded means serving to support each of the said movable electrodes, and gearing interconnecting the said two movable electrodes comprisng intermeshing gear wheels.

14. In a spark gap comprising two movable electrodes each bridging a pair of fixed electrodes, screw threaded means supporting each of the said movable electrodes, each of the said movable electrodes being provided with a gear wheel, the said gear wheels being in engagement one with the other and the said screw threaded means comprising a right handed screw thread for one of the said movable electrodes and a left handed screw thread for the other of the said movable electrodes.

15. In combination in a spark gap, having an adjustable electrode having a cylindrical periphery provided with a screw thread and a frame having a bore provided with a screw thread for coöperating with the said peripheral screw thread, and the wall of the said frame inclosing the said adjustable electrode being interrupted by a radial slot, and a spring steadying device serving to resiliently bridge the said slot.

CHARLES E. CAMPBELL.

Witnesses:
Lawrence E. Gott,
Gustave E. Anderson.

C. E. CAMPBELL.

ELECTRIC TRANSFORMER.

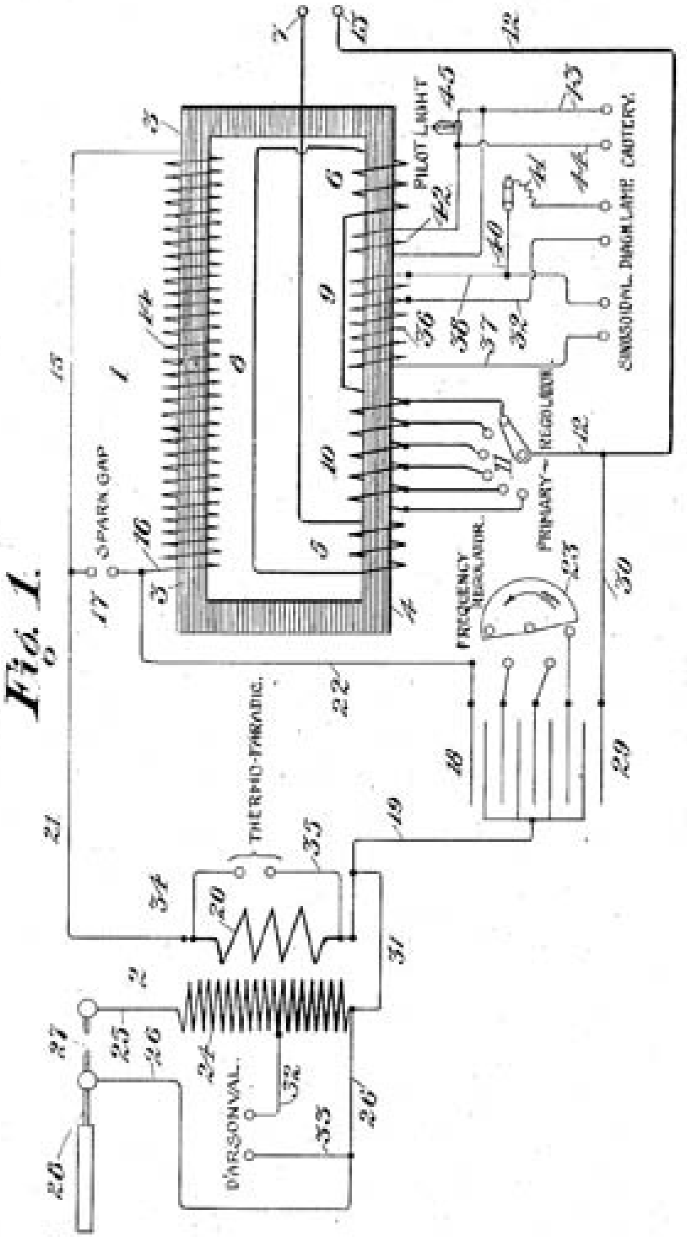
APPLICATION FILED MAY 7, 1910.

1,059,435.

Patented Apr. 22, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



7
13
12
PILOT LIGHT
45
43
44
41
42
6
40
9
36
38
37
32
SINUSOIDAL
DIAGN. LAMP
CAUTERY
REGULATOR
PRIMARY—
11
12
10
5
4
3
3
14
1
8
15
SPARK GAP
16
17
FREQUENCY REGULATOR
23
30
22
THERMO-FARADIC
18
29
19
21
34
35
20
31
2
27
25
26
24
32
D'ARSONVAL
33
26'
28

Witnesses:

A. Ackroyd

W. J. Dunmey

Inventor:

Charles E. Campbell

by his Attorneys

Phillips Van Everen & Fish

C. E. CAMPBELL.
ELECTRIC TRANSFORMER.
APPLICATION FILED MAY 7, 1910.

1,059,435.

Patented Apr. 22, 1913.
2 SHEETS—SHEET 2.

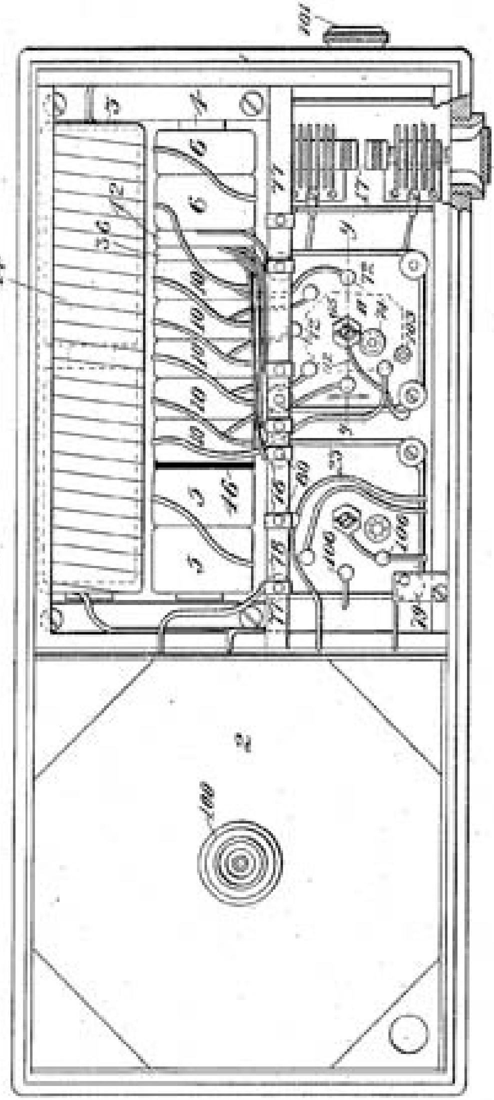

101
32
5
4
9
6
11
12
36
14
17
10
16
2
78
77
20
100

Fig. 2.

Witnesses:
A. Ackroyd
W. J. Dummey.

Inventor:
Charles E. Campbell
by his Attorneys
Phillips Van Everen & Fish

UNITED STATES PATENT OFFICE.

CHARLES E. CAMPBELL, OF LYNN, MASSACHUSETTS, ASSIGNOR TO CAMPBELL ELECTRIC COMPANY, OF LYNN, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ELECTRIC TRANSFORMER.

1,059,435. Specification of Letters Patent. **Patented Apr. 22, 1913.**

Original application filed November 10, 1909, Serial No. 527,153. Divided and this application filed May 7, 1910. Serial No. 560,095.

To all whom it may concern:

Be it known that I, Charles E. Campbell, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Electric Transformers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to electric transformers and more particularly to electric transformers for use in electro therapeutic apparatus. This application is a division of an application for electro-therapeutic apparatus filed November 10, 1909, Serial No. 527,153, which eventuated in the issue of Letters Patent, No. 1,012,326 to Charles E. Campbell on December 19, 1911.

The object of the present invention is to produce transformers for use in electro-therapeutic apparatus having their windings so arranged that they are more efficient in operation and regulation and are more safe to use than transformers heretofore constructed. With the above object in view, one feature of the present invention relates to a transformer in which certain of the primary windings are thrown in and out of circuit to regulate the primary current of the transformer.

Another feature of the invention relates to a transformer having low-tension and high-tension secondary windings so arranged that the transformer operates efficiently as a transformer and at the same time is protected against destructive discharges from the high-tension secondary.

Still another feature of the present invention relates to a transformer having a connection between the primary and secondary and having the primary and secondary wound in such relative directions that in a circuit through the common connection and the primary and secondary series the primary and secondary windings will oppose each other as a protection against accidental contact with the primary and secondary windings.

Still other features of the present invention relate to certain constructions, arrangements and combinations of parts hereinafter described, the advantages of which will be apparent to one skilled in the art from the following description.

In the accompanying drawings, Figure 1 is a diagram of the electric circuits in an apparatus constructed in accordance with the present invention; Fig. 2 is a plan view of the apparatus with the controlling handles, the cover-plate and other external parts removed.

The present invention is illustrated as embodied in the transformers employed in the electro-therapeutic apparatus which is illustrated and described in the patent to Charles E. Campbell, No. 1,012,326.

The apparatus comprises as is common in apparatus of this type, a high-tension transformer adapted to be energized by alternating electric currents such as may be obtained from ordinary electric lighting systems. This transformer generates in its principal secondary winding an alternating current of high tension, which is converted into a succession of oscillatory discharges by means of a condenser and a spark gap. In combination with the high-tension transformer I use a second transformer or high-frequency induction coil of the type known as the Tesla coil, this second transformer or coil operating to transform the oscillatory discharges set up by the condenser and spark gap into an alternating or oscillatory current of high frequency and of such high tension as to evince many of the characteristics of static electricity.

In the diagram the first or high-tension transformer is designated generally by the reference number 1 and the second transformer or Tesla coil by the reference number 2. The transformer 1, for reasons which will be stated hereinafter, is of what is commonly known as the "core type," having a core comprising two parallel legs 3 and 4 connected at their ends by end pieces or yokes so as to constitute a closed magnetic circuit. The primary windings of the transformer are placed upon the leg 4 and constitute a number of separately-wound coils. At the ends of the leg 4 are main primary coils 5 and 6 which are always operative when the transformer is in use. The coils 5 are connected with one of the terminals 7 through which the transformer is supplied with the alternating current by which it is energized. After traversing the coils 5 the current passes, through a wire 8, to the coils 6 which are wound in the same sense as the coils 5. From the coils 6 the current passes through a wire 9 to a series of primary coils 10 arranged between the coils 5 and 6. Each of the coils 10 has an independent connection with one of the contact points of the primary regulator 11, and the movable contact member of the primary regulator is connected, by a wire 12, with the other supply terminal 13. The above-described arrangement of primary coils constitutes means for varying the amount of current passing through the primary windings and energizing the transformer. When fewer turns are used in the primary winding the ratio of transformation between the secondary and primary voltages will be increased, the secondary winding being more strongly energized and forcing more current through the different external circuits connected thereto, and the primary will in consequence admit a greater primary current from the supply mains. When less energy is desired, more turns are used in the primary winding and the ratio between the secondary and the primary voltages is diminished, the result being that the secondary voltage is lessened, and less current forced through the various secondary circuits, with consequent diminution of the amount of current drawn by the primary from the supply mains. The impedance of any turn of the primary winding will be due to its own ohmic resistance and to the magnetic flux which links said turn. The magnetic lines which link both the primary and the secondary and constitute the effective flux make up one component of the total flux linking said turn of the primary, and the impedance due to this component of the flux will vary with the impedance of the secondary circuit. Another component of the total flux is the leakage flux, or the magnetic lines linking said turn which do not cut the secondary windings, and the impedance due to the leakage flux is not dependent upon the impedance of the secondary circuit. The effective flux does useful work in exciting the secondary, while the leakage flux acts only to cut down the primary current. Any primary turn is of greater efficiency the larger the ratio is between the effective and the leakage flux linking the turn. This greater efficiency of some turns of the primary over others will depend upon their position upon the magnetic core with respect to the secondary coil. I have accordingly placed the coils 5 and 6, which are always in circuit, at the ends of the primary leg 4 of the core, and in a position upon the magnetic circuit closest to the high potential secondary 14, giving the coils 5 and 6 the position of highest efficiency. The regulating coils 10, which are not always in use, are placed on the magnetic circuit at a greater distance from the secondary windings than the windings 5 and 6, and consequently in a position of less efficiency. The effect of throwing the coils 10 into the circuit will not only lessen the ratio of voltage transformation between the secondary and the primary, but the greater leakage flux of the windings 10 will cause them to act in the nature of a choke coil in the primary circuit and very efficiently act to control the amount of energy drawn from the supply mains. By moving the primary regulator so as to include more or less of the primary coil 10 the turns of the primary winding, and thus its impedance, may be increased or diminished so as to vary the amount of current flowing through the primary winding.

The main secondary winding 14 of the transformer is mounted upon the leg 3 of the core and is connected, by wires 15 and 16, with the spark gap 17.

The primary winding consists of a comparatively few turns of wire and the secondary winding of a greater number of turns, so that the transformer acts as a "step-up" transformer to step up the primary voltage to a high secondary tension. By placing the primary and secondary windings upon different legs of the transformer core, they are more completely separated and better insulated from each other to guard against possible break-down between the primary and secondary.

A condenser 18 is connected with the wire 16 by a wire 22, at one terminal, and the other terminal of the condenser is connected, by a wire 19, with the primary winding 20 of the Tesla coil. The winding 20 is connected at its other terminal, by a wire 21, with the other side of the spark gap 17. By this arrangement the condenser is alternately charged and discharged through the winding 20 of the Tesla coil, and the discharges have the oscillatory character due to the use of the condenser and the spark gap.

In order to vary the frequency of the oscillatory discharges so as to modify the character of the currents produced by the Tesla coil, the condenser is arranged to have a variable capacity which is regulated by means of a frequency-regulator 23, as described and illustrated in the above mentioned Campbell patent. The terminals of the secondary winding 24 of the Tesla coil are connected, by conductors 25 and 26, with the members of a spark gap 27, which is adjustable, in the ordinary manner, by means of a sliding rod 28.

In place of connecting the primary and secondary windings of the Tesla coil with the earth in the usual manner, the lowermost plate 29 of the condenser 18 is connected, by a wire 30, with the wire 12 connected with the primary winding of the transformer and with the supply system by which the apparatus is energized to form a safety connection, as described in the above mentioned Campbell patent.

Currents of the characters usually employed in therapeutics and derived from a high-frequency coil are derived from the Tesla coil 2 in the present invention, either from the terminals of the spark gap 27 or by other connections illustrated in Fig. 1. A current of the character usually designated as a D'Arsonval current is obtained through terminals connected, by wires 32, 33 and 26, with a portion of the secondary winding 24. This portion is made of heavier wire than the rest of the secondary winding, and the arrangement is such that the D'Arsonval current supplied in this manner is of lower tension but greater volume than the current generated in the Tesla secondary as a whole. A current of high frequency but of lower tension than that produced in the secondary winding 24 is obtained through terminals connected by wires 34 and 35 with the terminals of the primary winding 20 of the Tesla coil. This current may be designated as a thermo-faradic current.

In addition to the high-tension and high-frequency currents above referred to, the apparatus is arranged to supply alternating currents of comparatively low tension and of the frequency of the alternating current by which the apparatus is energized. One of these currents, which may be designated as a sinusoidal current, and which is designed for direct personal application, is induced in an auxiliary secondary winding 36 in the transformer 1, and this secondary winding, for reasons which will be hereinafter pointed out, is located upon the same leg of the core as the primary winding of the transformer and is interposed between the coils of the primary winding. The sinusoidal current is obtained from terminals connected, by wires 37 and 38, with the terminals of the winding 36.

In addition to the currents above described for direct application, the apparatus is designed to furnish currents for indirect use, such currents being adapted for the operation of cauterizing apparatus and diagnostic lamps. The current for the diagnostic lamp is obtained from terminals which are connected, through wires 38, 39 and 40, and through a variable resistance device 41, with the secondary winding 36. The connections are arranged as shown in Fig. 1 so that in the production of this current only a portion of the winding 36 is employed, so that the lamp current is of lower tension than the sinusoidal current. The variable resistance device 41 constitutes a regulator for the diagnostic lamp. The cautery current is obtained from another auxiliary secondary winding, 42, arranged adjacent to the winding 36. This winding 42 is so proportioned as to produce a current of very low tension, which may be safely used for the purpose designated. The cautery current is obtained from terminals connected with the winding 42 by means of wires 43 and 44.

To furnish at all times an indication when the transformer is in operation, a small electric lamp 45, designated as a pilot light, is connected across the wires 42 and 43 and this lamp glows whenever there is any flow of current in the primary winding of the transformer.

The mechanical construction of the apparatus particularly of the transformers may now be considered. This is most fully disclosed in Fig. 2 of the drawings, which shows a plan view of the interior arrangements of the apparatus. As shown in Fig. 2, the primary windings 5 and 6 each constitute two separately-wound coils. Owing to this arrangement and to the further division of the primary winding into the separately-wound coils 10, the entire primary winding of the transformer is divided into a large number of small sections. The utility of this arrangement results from the production in high-frequency apparatus of static currents and waves of very high tension and of incidental character which have a serious tendency to escape from the circuits of the apparatus and to leap considerable air spaces in preference to following conductors of high impedance. Such waves or currents occur in primary winding of the transformer and it has been found that in the absence of special precaution there is danger of the disruptive discharge of such currents through the primary and the consequent breaking down of the insulation therein, leading to the production of destructive arcs. I have found, however, that by winding the primary in separate coils or sections as above described, the insulation of the primary winding is so improved as to protect it against the effects which I have described.

The arrangement of the primary winding of the transformer is such that the intermediate coils 10, when they are not included in the primary circuit tend to act as secondary coils with relation to the main coils 5 and 6 precisely after the manner of an auto-transformer, that is to say, a potential in the coils 10 is induced by the magnetic flux in the core due to the action of the coils 5 and 6. This potential is opposite to that of the alternating current by which the primary winding is energized, and when the coils 10 are not connected in series with the main coils the difference in potential between the left-hand coil 10 and the adjacent right-hand coil 5 is much higher than any difference in potential due to the energizing current alone. To guard against evil effects from this circumstance, a plate 46 of insulating material is interposed between the coils 5 and the coils 10.

The control of the transformer by varying the amount of primary winding in operation is an economical method, since the flow of current is controlled not by waste of current in external heat-producing resistance devices such as are commonly used, but by the impedance in the primary winding itself. The control of the transformer is thus accomplished in an economical and effective manner without the use of any additional parts except the controlling switch, and the bulk of the apparatus is thus minimized.

The general form of the transformer is in itself a protection against the action of the high-tension oscillatory currents generated, since it permits a sufficient separation of the primary and secondary windings to prevent occurrences of disruptive discharges from the secondary winding through the primary winding. This form of transformer has thus peculiar advantages when used in connection with a condenser and a spark gap to produce oscillatory currents of high tension, and such an arrangement is novel so far as I am informed.

A further advantage resulting from the arrangement of the main primary coils 5 and 6 at the extremities of the leg 4 of the transformer core resides in the fact that the principal portions of the primary winding are thus brought as close as possible to the secondary winding, so that the magnetic paths connecting the primary and secondary windings are thus of the shortest possible length and thus efficiency and economy in the operation of the transformer are secured. This arrangement also permits the location of the primary-regulating coils 10 at a point where their inductive effect is slight, so that the impedance of these coils may act more effectively to regulate the production of current in the secondary winding.

The arrangement of the transformer with a plurality of independent secondary windings adapted to generate currents of different volumes and tensions permits the use of a single transformer for a variety of purposes and thus greatly increases the usefulness of the apparatus without correspondingly increasing its bulk or expense. In this connection it will be noted that by suitably proportioning the several secondary windings, currents of any volumes and tensions within the extreme limitations of the apparatus may be secured. In the preferred embodiment of the invention I have found that for the production of the cautery current a winding of very few turns of heavy wire adapted to give a heavy current under an E. M. F. of about three volts gives satisfactory results while restricting the voltage to such low tension as to render it perfectly safe and convenient for use in cauterizing apparatus. In the diagnostic lamp, I find an E. M. F. of ten volts to be sufficient, while in the sinusoidal circuit I employ an E. M. F. of twenty-four volts and the winding 36 is, therefore, suitably proportioned to produce such voltages.

The position of the secondary windings 36 and 42 upon the same leg of the transformer as the primary windings is a novel feature of importance, since it secures economy in space by placing these secondary windings at a point where primary windings would have a comparatively low efficiency in exciting the secondary winding 14. Moreover, by placing the secondary windings 36 and 42 upon the same leg and between the two primary coils, a good magnetic linkage is obtained between these windings and the primary, with a correspondingly good efficiency of current transformation. The arrangement has a further advantage in that it removes the comparatively low-tension secondary windings from the neighborhood of the high-tension secondary winding 14 and thereby reduces the liability of disruptive discharges in the transformer.

Another danger to be guarded against in the operation of the apparatus resides in the possibility of connecting applicators to one of the D'Arsonval terminals and one of the thermo-faradic terminals, so as to put the patient or the operator into circuit with the secondary windings of both the transformer and the Tesla coil. Such a result may occur, for example, by using the right-hand D'Arsonval terminal and the upper thermo-faradic terminal in Fig. 1. To prevent danger from such a cause, the windings of the Tesla coil are so arranged and connected that in a circuit formed as above described they oppose each other, so that the resulting E. M. F. is equal to the difference and not to the sum of the E. M. F.'s which may be derived from either pair of terminals when properly connected. This arrangement also avoids a high difference in potential between the adjacent terminals of the primary and secondary windings of the Tesla coil.

While the improvement which consists in the winding of the primary and secondary windings in such directions that in a circuit formed through the electric connection between them and the two windings in series the windings oppose each other, is illustrated in connection with a transformer of the type commonly known as the Tesla coil, it is evident that this manner of winding is equally applicable to other types of transformers.

As a further protection to the apparatus, the parts are so proportioned and arranged that a short-circuit, either in the spark gap

17 or in the sinusoidal diagnostic lamp or cautery terminals, cannot result in burning out the transformer. This is due partly to the form of the transformer in which the magnetic flux through the core is limited by suitably proportioning the end-pieces or end yokes of the core, and also to the use of sufficient resistance in the secondary coils 36 and 42 and of a sufficiently small number of turns in these coils to prevent the overloading of the primary coils of the transformer.

While the various features of my invention are particularly susceptible to conjoint use in an apparatus of the kind hereinbefore referred to, since they all contribute to the production of a safe and reliable apparatus, it will be obvious that the invention in some of its aspects may be embodied in an apparatus from which some of the noted features are omitted. The invention hereinbefore described is not limited to the embodiment specifically illustrated and described, but may be embodied in various other forms within the spirit of the invention and the scope of the following claims.

I claim—

1. An electric transformer having, in combination, a core having two substantially parallel legs connected by end yokes, a primary winding on one leg divided into sections located principally near the ends of the leg, a low-tension secondary winding on the same leg as the primary winding and interposed between the sections of the primary winding, and a high-tension secondary winding on the second leg of the core.

2. An electric transformer having, in combination, a core having a plurality of legs, a primary winding on one leg divided into sections located principally near the ends of leg, a low-tension secondary on the same leg as the primary and interposed between the sections of the primary winding, and a high-tension secondary winding on another leg of the core.

3. An electric transformer having, in combination, a secondary winding, and a primary winding consisting of a plurality of sections of which certain sections possess comparatively good magnetic linkage with the secondary and are adapted to always be in circuit when the transformer is used and of which certain other sections possess a comparatively poorer magnetic linkage with the secondary, and means for throwing more or less of the latter named sections of the primary winding in series with the first named sections of the primary winding to regulate the primary current.

4. An electric transformer having, in combination, a magnetic core having a plurality of legs, a primary winding, and a secondary winding on the same leg as the primary winding in proximity to the primary winding having a few turns of wire of sufficient resistance so that the overloading of the transformer is prevented in case the secondary is short-circuited.

5. An electric transformer having, in combination, a magnetic core of comparatively high reluctance having a plurality of legs, a primary winding, and a secondary winding on the same leg as the primary winding in proximity to the primary winding having a few turns of wire of sufficient resistance so that the overloading of the transformer is prevented in case the secondary is short-circuited.

6. An electric transformer having, in combination, a primary winding, a secondary winding, and an electrical connection between one end of the primary winding and one end of the secondary winding, the primary and secondary windings being wound relatively to each other in such directions that in a circuit formed through said electric connection and the two windings in series the windings oppose each other so that the resultant E. M. F. in said circuit is equal to the difference of the E. M. F.'s of the individual windings.

CHARLES E. CAMPBELL.

Witnesses:
HORACE VAN EVEREN,
FRED R. CAMPBELL.

C. E. CAMPBELL.

ELECTROTHERAPEUTIC APPARATUS.

APPLICATION FILED NOV. 10, 1909.

1,012,326.

Patented Dec. 19, 1911.

2 SHEETS—SHEET 1.

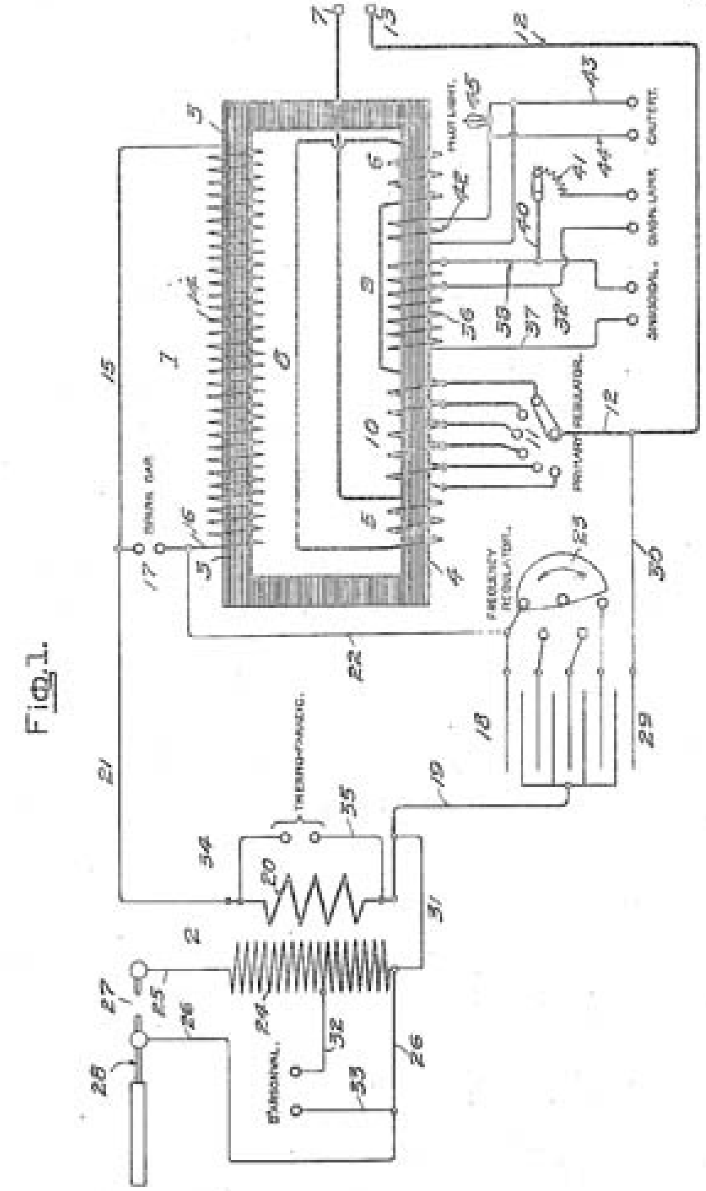

7
13
12
43
45
PILOT LIGHT
CAUTERY
44
41
42
6
40
DIAGN. LAMP
39
37
38
36
SINUSOIDAL
9
8
1
14
15
10
11
PRIMARY REGULATOR
5
4
3
16
17
SPARK GAP
FREQUENCY REGULATOR
23
35
22
18
29
21
19
TREMO-FARADIC
34
20
31
2
24
25
27
26
32
33
28
SINUSOIDAL

Fig. 1.

Witnesses:

M. G. Crozier.

W. J. Drummey

Inventor,

Charles E. Campbell

by his Attorneys

Phillips Van Everen & Fish

C. E. CAMPBELL.
ELECTROTHERAPEUTIC APPARATUS.
APPLICATION FILED NOV. 10, 1909.

1,012,326.

Patented Dec. 19, 1911.
3 SHEETS-SHEET 1.

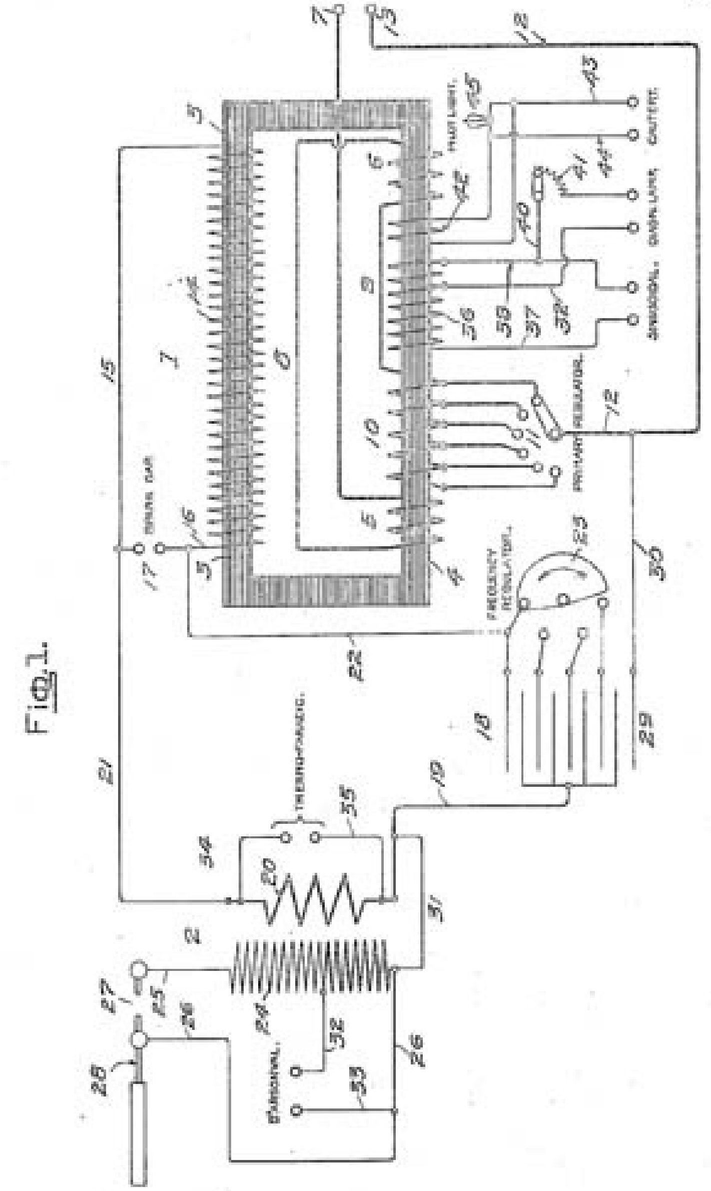


Fig. 1.
7
13
12
PILOT LIGHT.
45
43
CAUTERY.
44
41
DIAGN. LAMP.
42
40
6
9
36
38
37
39
SINUSOIDAL.
PRIMARY REGULATOR.
11
12
10
5
4
3
1
8
14
15
SPARK GAP.
16
17
FREQUENCY REGULATOR.
23
35
22
18
29
19
21
THERMO-FARADIC.
34
35
20
31
2
27
25
24
26
32
28
D'ARSONVAL.
33
26

Witnesses:
M. G. Crozier.
W. J. Drummey

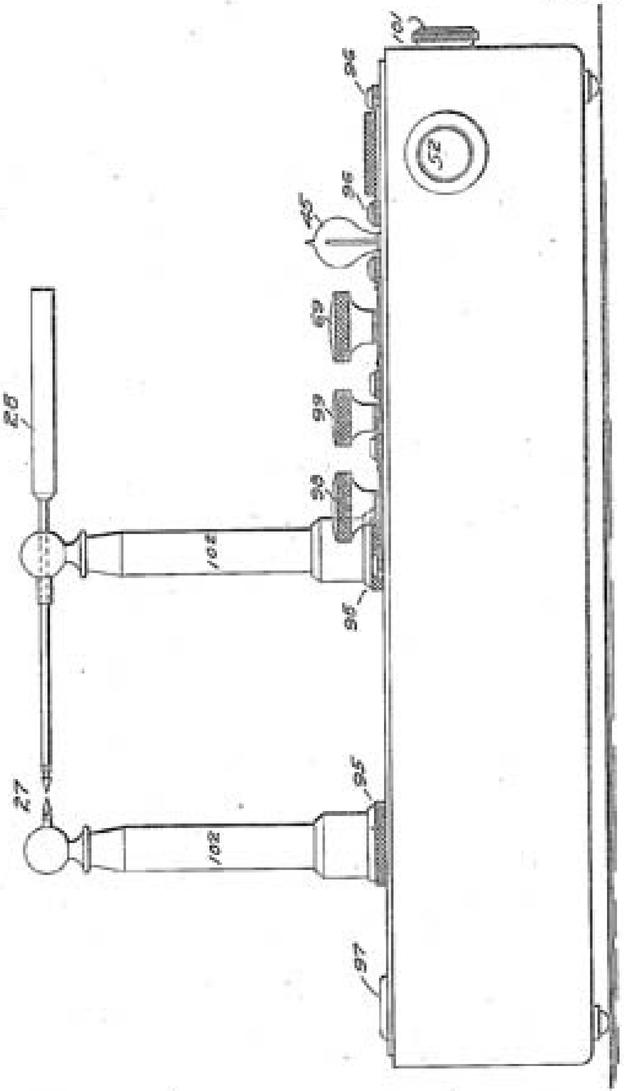
Inventor,
Charles E. Campbell
by his Attorneys
Phillips Van Everen & Fish

C. E. CAMPBELL.
ELECTROTHERAPEUTIC APPARATUS.
APPLICATION FILED NOV. 16, 1909.

1,012,326.

Patented Dec. 19, 1911.
6 SHEETS—SHEET 2.

Fig. 2.



101
94
52
45
96
63
66
99
98
26
102
27
95
102
97

Witnesses:
M. G. Crozier
H. J. Dummey.

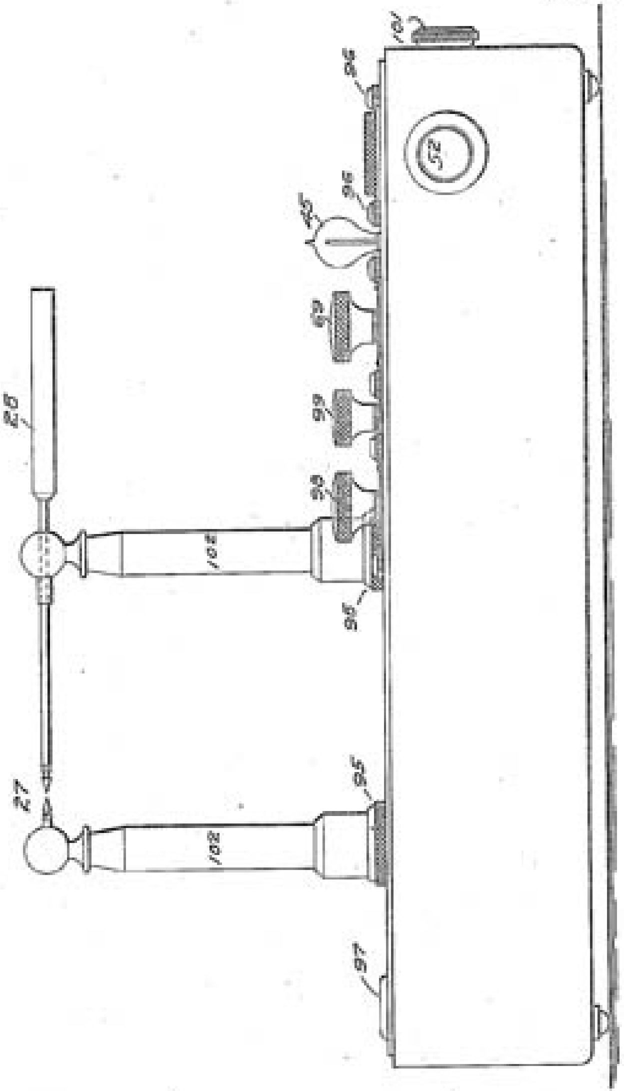
Inventor,
Charles E. Campbell
by his Attorneys
Phillips Van Everen & Fish

C. E. CAMPBELL.
ELECTROTHERAPEUTIC APPARATUS.
APPLICATION FILED NOV. 16, 1909.

1,012,326.

Patented Dec. 19, 1911.
6 SHEETS—SHEET 2.

Fig. 2.


27
26
102
102
97
95
98
98
99
69
45
96
96
101
52

Witnesses:
M. G. Crozier
H. J. Dummey.

Inventor,
Charles E. Campbell
by his Attorneys
Philipp Van Everen & Fish

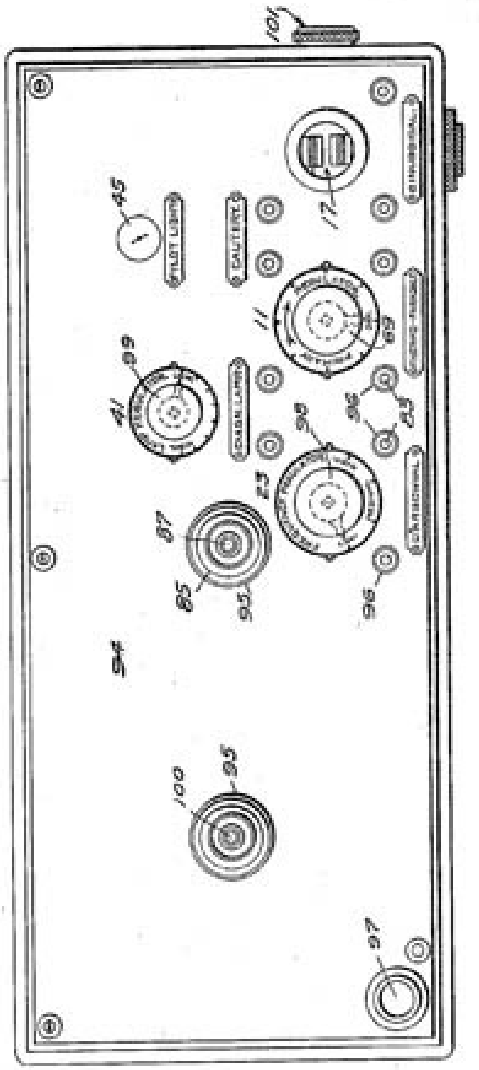
C. E. CAMPBELL.
ELECTROTHERAPEUTIC APPARATUS.
APPLICATION FILED NOV. 10, 1909.

1,012,326.

Patented Dec. 19, 1911.

6 SHEETS—SHEET 3

Fig. 3.


101
17
45
PILOT LIGHT
CAUTERY
11
69
41
89
DIAGN. LAMPS
98
96
43
23
87
85
93
96
94
100
95
97

Witnesses:
M. G. Crozier
W. J. Drummey

Inventor,
Charles E. Campbell
By his Attorneys
Phillips Van Everen & Fish

C. E. CAMPBELL.
ELECTROTHERAPEUTIC APPARATUS.
APPLICATION FILED NOV. 10, 1909.

1,012,326. Patented Dec. 19, 1911.
4 SHEETS—SHEET 3

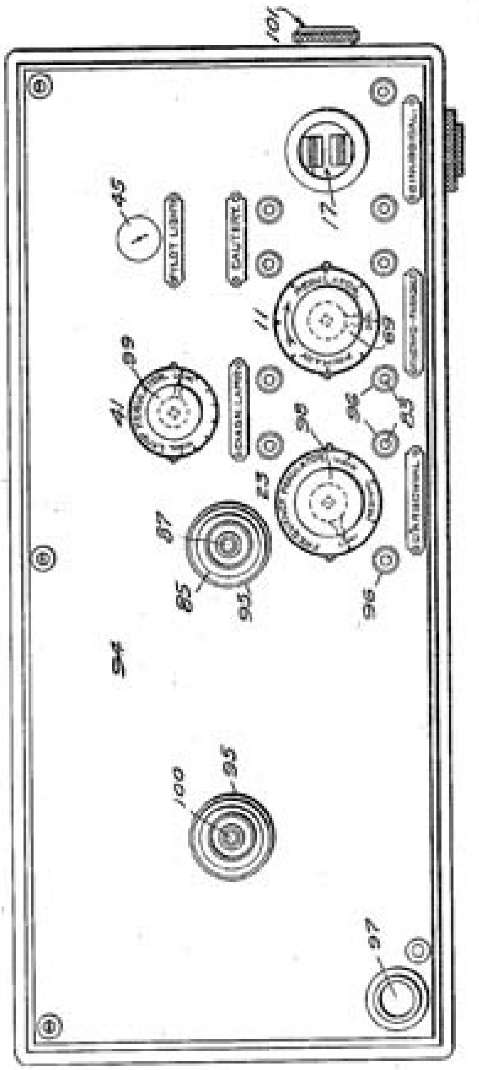

101
17
45
PILOT LIGHT
CAUTERY
11
69
89
41
DIAGN. LAMPS
98
96
43
23
87
85
93
96
94
100
95
97

Fig. 3.

Witnesses:
M. G. Crozier
W. J. Drummey

Inventor,
Charles E. Campbell
By his Attorneys
Philipps Van Everen & Fish

C. E. CAMPBELL.
ELECTROTHERAPEUTIC APPARATUS.
APPLICATION FILED NOV. 10, 1909.

1,012,326. Patented Dec. 19, 1911.

8 SHEETS—SHEET 4.

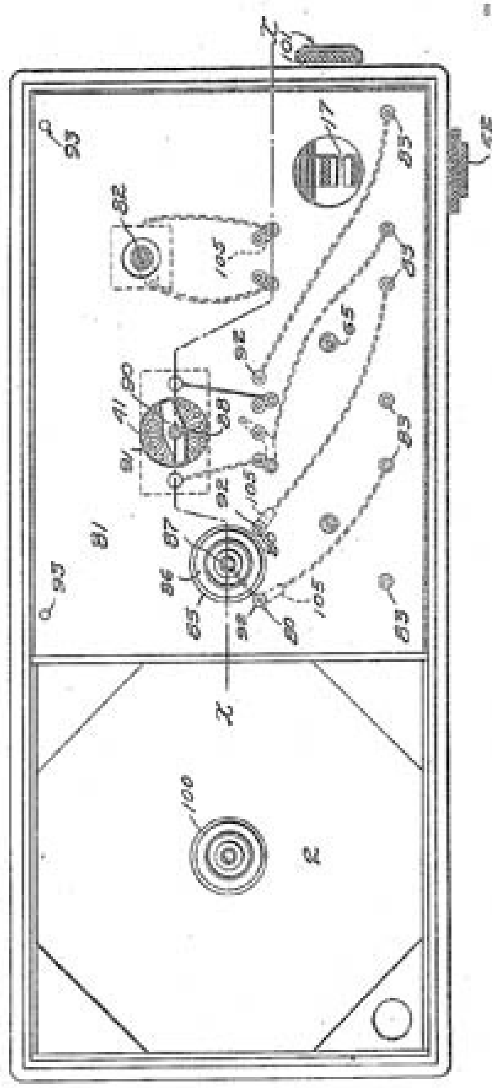


Fig. 4.

Witnesses:
M. G. Crozier
H. J. Drummey.

Inventor.
Charles E. Campbell
by his Attorneys
Phillips Van Everen & Fish

C. E. CAMPBELL.
ELECTROTHERAPEUTIC APPARATUS.
APPLICATION FILED NOV. 10, 1909.

1,012,326. Patented Dec. 19, 1911.

8 SHEETS—SHEET 4.

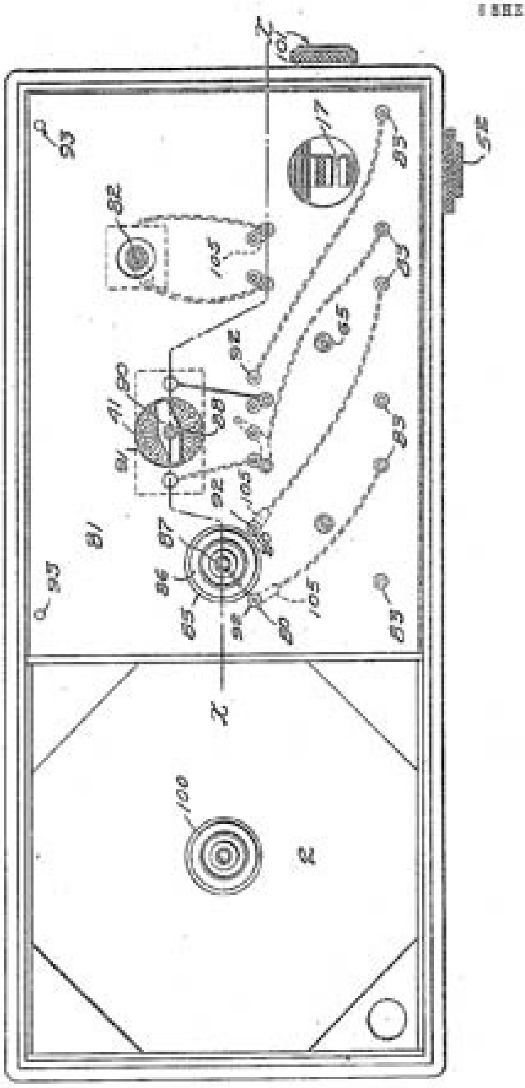

Y
10
117
52
93
82
103
83
65
92
90
91
88
94
105
87
86
85
89
81
Z
100
2

Fig. 4.

Witnesses:
M. G. Crozier
H. J. Drummey

Inventor.
Charles E. Campbell
by his Attorneys
Phillips Van Everen & Fish

C. E. CAMPBELL.

ELECTROTHERAPEUTIC APPARATUS.

APPLICATION FILED NOV. 10, 1909.

1,012,326.

Patented Dec. 19, 1911.

6 SHEETS—SHEET 5.

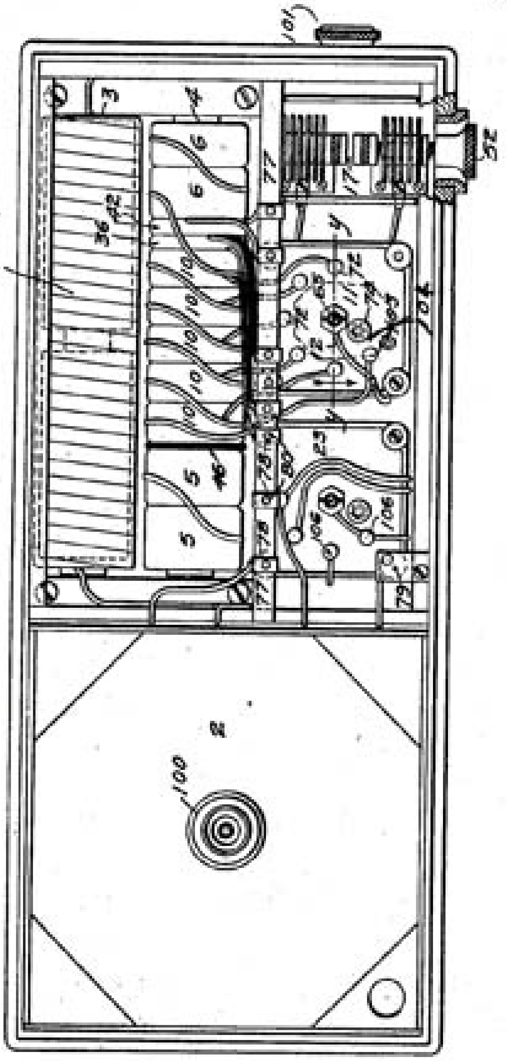

101
32
3
4
6
14
36
42
77
17
10
104
23
5
46
106
78
79
2
100

Fig.5.

Witnesses:

M. G. Crozier

H. J. Drummey.

Inventor:

Charles E. Campbell

by his Attorneys

Phillips Van Everen & Fish

C. E. CAMPBELL.

ELECTROTHERAPEUTIC APPARATUS.

APPLICATION FILED NOV. 10, 1909.

1,012,326.

Patented Dec. 19, 1911.

6 SHEETS—SHEET 5.

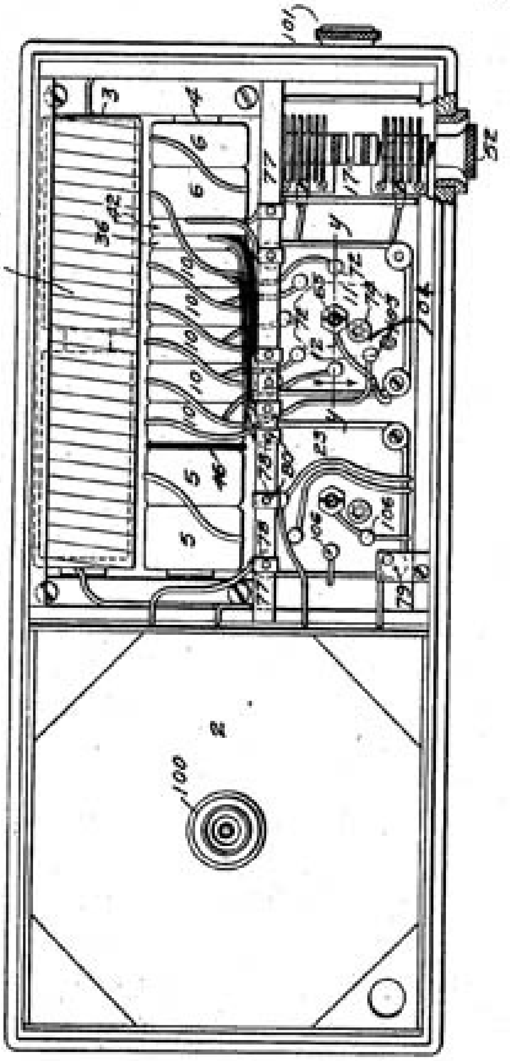

101
3
4
6
6
77
17
32
14
36
42
10
10
10
10
10
Z
Y
Y
104
5
46
5
78
23
106
106
78
77
79
2
100

Fig. 5.

Witnesses:

M. G. Crozier

H. J. Drummey

Inventor:

Charles E. Campbell

by his Attorneys

Phillips Van Everen & Fish

C. E. CAMPBELL.
ELECTROTHERAPEUTIC APPARATUS.
APPLICATION FILED NOV. 10, 1909.

1,012,326. Patented Dec. 19, 1911.

6 SHEETS—SHEET 6.

Fig. 6.

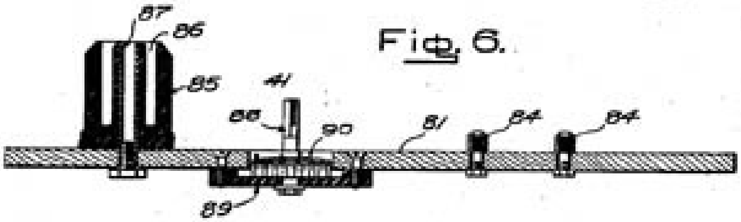

87
86
85
41
88
90
81
84
84
89

Fig. 7.

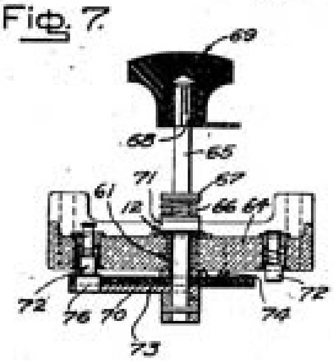

69
68
65
71
67
61
12
66
64
72
76
70
73
74
72

Fig. 8.

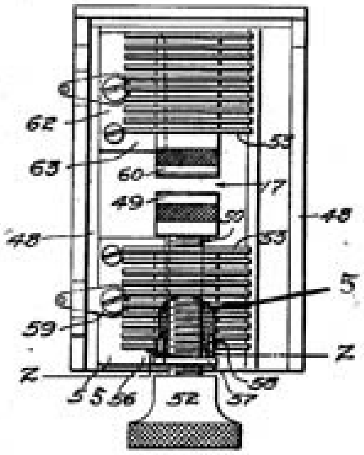
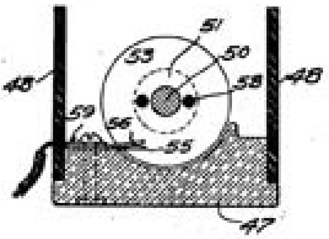

62
53
63
60
17
49
50
48
48
53
51
59
Z
Z
55
56
52
57
58

Fig. 9.


51
53
50
48
48
58
59
56
55
47

Witnesses:
M. G. Crozier.
H. J. Drummey.

Inventor,
Charles E. Campbell
by his Attorneys
Phillips Van Everen & Fish.

C. E. CAMPBELL.

ELECTROTHERAPEUTIC APPARATUS.

APPLICATION FILED NOV. 10, 1909.

1,012,326. Patented Dec. 19, 1911.

6 SHEETS—SHEET 6.

Fig. 6.

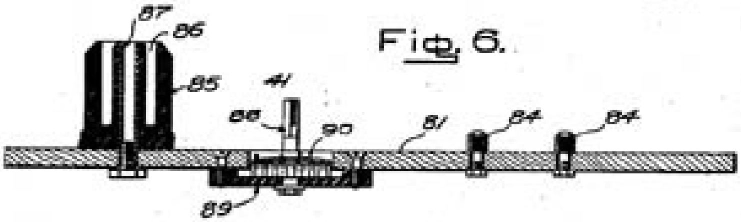

87
86
85
41
88
90
81
84
84
89

Fig. 7.

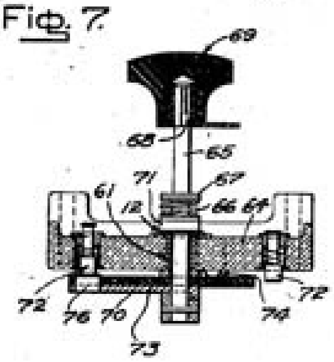

69
68
65
71
67
61
12
66
64
72
76
70
73
74
72

Fig. 8.

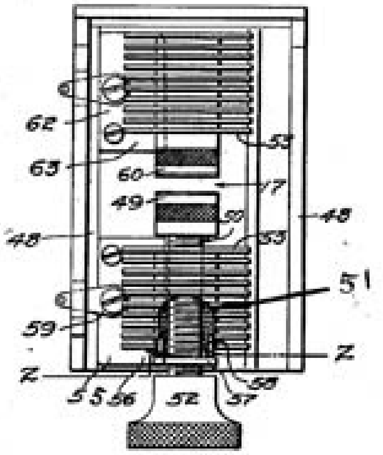
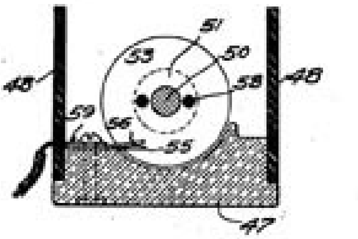

62
53
63
60
17
49
50
48
48
53
51
59
Z
Z
55
56
52
57
58

Fig. 9.


51
53
50
48
58
48
59
56
55
47

Witnesses:

M. G. Crozier.

W. J. Drummey.

Inventor,

Charles E. Campbell

by his Attorneys

Philipp, Van Everen & Fish.

UNITED STATES PATENT OFFICE.

CHARLES E. CAMPBELL, OF LYNN, MASSACHUSETTS, ASSIGNOR TO CAMPBELL ELECTRIC COMPANY, OF LYNN, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ELECTROTHERAPEUTIC APPARATUS.

1,012,326. Specification of Letters Patent. **Patented Dec. 19, 1911.**

Application filed November 10, 1909. Serial No. 527,153.

To all whom it may concern:

Be it known that I, Charles E. Campbell, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Electrotherapeutic Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to electro-therapeutic apparatus adapted for use in connection with the various applications of electricity to medicine and surgery, such as radiography, cautery, diagnosis, and the application of electric currents to the body.

One object of the invention is to produce a simple and compact apparatus for the purposes above set forth, in which the several currents of the different characters and tensions required for the purposes referred to may be derived in a simple and safe manner from a single source of supply.

To this end my invention comprises a transformer adapted to produce currents of different tensions in a plurality of independent circuits either at the same time or separately.

Another object of the invention is to produce an apparatus of the kind referred to which shall be insured both against injury to itself arising from internal causes, and against injury to the operator arising either from careless operation or from accidental derangement in the apparatus.

To this end the invention comprises various novel arrangements and constructions which, together with novel and useful features of operation and construction not hereinbefore specifically referred to, will be set forth in connection with the following description of the illustrated embodiment of the invention.

In the accompanying drawings, Figure 1 is a diagram of the electric circuits in an apparatus constructed in accordance with the present invention; Fig. 2 is a front elevation of the apparatus diagrammatically illustrated in Fig. 1; Fig. 3 is a plan view of the apparatus; Fig. 4 is a plan view of the apparatus with the controlling handles, the cover-plate and other external parts removed; Fig. 5 is a plan view of the apparatus with the connection-board as well as the external parts removed; Fig. 6 is a vertical section taken on line *x*—*x* in Fig. 4, looking from front to rear, of the removable connection-board and parts carried thereby; Fig. 7 is a vertical section on line *y*—*y* in Fig 5, looking from the rear, of the primary regulator; Fig. 8 is a detailed plan view of the spark gap of the high-tension transformer; and Fig. 9 is a vertical section on line *z*—*z* in Fig. 8, looking from front to rear.

The illustrated embodiment of my invention may be best understood by considering first the diagram of the electric circuits, Fig. 1 of the drawings. The apparatus comprises, as is common in apparatus of this type, a high-tension transformer adapted to be energized by alternating electric currents such as may be obtained from ordinary electric lighting systems. This transformer generates in its principal secondary winding an alternating current of high tension, which is converted into a succession of oscillatory discharges by means of a condenser and a spark gap. In combination with the high-tension transformer I use a high-frequency induction coil of the type known as the Tesla coil, this coil operating to generate alternating currents of high frequency and of such high tension as to evince many of the characteristics of static electricity.

In the diagram the high-tension transformer is designated generally by the refence number 1 and the Tesla coil by the reference number 2. The transformer 1, for reasons which will be stated hereinafter, is of what is commonly known as the "core type", having a core comprising two parallel legs 3 and 4 connected at their ends by end pieces so as to constitute a closed magnetic circuit. The primary windings of the transformer are placed upon the leg 4 and constitute a number of separately-wound coils. At the ends of the leg 4 are main primary coils 5 and 6 which are always operative when the transformer is in use. The coils 5 are connected with one of the terminals 7 through which the transformer is supplied with the alternating current by which it is energized. After traversing the coils 5 the current passes, through a wire 8, to the coils 6 which are wound in

UNITED STATES PATENT OFFICE.

CHARLES E. CAMPBELL, OF LYNN, MASSACHUSETTS, ASSIGNOR TO CAMPBELL ELECTRIC COMPANY, OF LYNN, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ELECTROTHERAPEUTIC APPARATUS.

1,012,326. Specification of Letters Patent. **Patented Dec. 19, 1911.**

Application filed November 10, 1909. Serial No. 527,153.

To all whom it may concern:

Be it known that I, CHARLES E. CAMPBELL, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Electrotherapeutic Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to electro-therapeutic apparatus adapted for use in connection with the various applications of electricity to medicine and surgery, such as radiography, cautery, diagnosis, and the application of electric currents to the body.

One object of the invention is to produce a simple and compact apparatus for the purposes above set forth, in which the several currents of the different characters and tensions required for the purposes referred to may be derived in a simple and safe manner from a single source of supply.

To this end my invention comprises a transformer adapted to produce currents of different tensions in a plurality of independent circuits either at the same time or separately.

Another object of the invention is to produce an apparatus of the kind referred to which shall be insured both against injury to itself arising from internal causes, and against injury to the operator arising either from careless operation or from accidental derangement in the apparatus.

To this end the invention comprises various novel arrangements and constructions which, together with novel and useful features of operation and construction not hereinbefore specifically referred to, will be set forth in connection with the following description of the illustrated embodiment of the invention.

In the accompanying drawings, Figure 1 is a diagram of the electric circuits in an apparatus constructed in accordance with the present invention; Fig. 2 is a front elevation of the apparatus diagrammatically illustrated in Fig. 1; Fig. 3 is a plan view of the apparatus; Fig. 4 is a plan view of the apparatus with the controlling handles, the cover-plate and other external parts removed; Fig. 5 is a plan view of the apparatus with the connection-board as well as the external parts removed; Fig. 6 is a vertical section taken on line *x*—*x* in Fig. 4, looking from front to rear, of the removable connection-board and parts carried thereby; Fig. 7 is a vertical section on line *y*—*y* in Fig 5, looking from the rear, of the primary regulator; Fig. 8 is a detailed plan view of the spark gap of the high-tension transformer; and Fig. 9 is a vertical section on line *z*—*z* in Fig. 8, looking from front to rear.

The illustrated embodiment of my invention may be best understood by considering first the diagram of the electric circuits, Fig. 1 of the drawings. The apparatus comprises, as is common in apparatus of this type, a high-tension transformer adapted to be energized by alternating electric currents such as may be obtained from ordinary electric lighting systems. This transformer generates in its principal secondary winding an alternating current of high tension, which is converted into a succession of oscillatory discharges by means of a condenser and a spark gap. In combination with the high-tension transformer I use a high-frequency induction coil of the type known as the Tesla coil, this coil operating to generate alternating currents of high frequency and of such high tension as to evince many of the characteristics of static electricity.

In the diagram the high-tension transformer is designated generally by the refence number 1 and the Tesla coil by the reference number 2. The transformer 1, for reasons which will be stated hereinafter, is of what is commonly known as the "core type", having a core comprising two parallel legs 3 and 4 connected at their ends by end pieces so as to constitute a closed magnetic circuit. The primary windings of the transformer are placed upon the leg 4 and constitute a number of separately-wound coils. At the ends of the leg 4 are main primary coils 5 and 6 which are always operative when the transformer is in use. The coils 5 are connected with one of the terminals 7 through which the transformer is supplied with the alternating current by which it is energized. After traversing the coils 5 the current passes, through a wire 8, to the coils 6 which are wound in the same sense as the coils 5. From the coils 6 the current passes through a wire 9 to a series of primary coils 10 arranged between the coils 5 and 6. Each of the coils 10 has an independent connection with one of the contact points of the primary regulator 11, and the movable contact member of the primary regulator is connected, by a wire 12, with the other supply terminal 13.

The above-described arrangement of primary coils constitutes means for varying the amount of current passing through the primary windings and energizing the transformer. When fewer turns are used in the primary winding the ratio of transformation between the secondary and primary voltages will be increased, the secondary winding being more strongly energized and forcing more current through the different external circuits connected thereto, and the primary will in consequence admit a greater primary current from the supply mains. When less energy is desired, more turns are used in the primary winding and the ratio between the secondary and the primary voltages is diminished, the result being that the secondary voltage is lessened, and less current forced through the various secondary circuits, with consequent diminution of the amount of current drawn by the primary from the supply mains. The impedance of any turn of the primary winding will be due to its own ohmic resistance and to the magnetic flux which links said turn. The magnetic lines which link both the primary and secondary and constitute the effective flux made up one component of the total flux linking said turn of the primary, and the impedance due to this component of the flux will vary with the impedance of the secondary circuit. Another component of the total flux is the leakage flux, or the magnetic lines linking said turn which do not cut the secondary windings, and the impedance due to the leakage flux is not dependent upon the impedance of the secondary circuit. The effective flux does useful work in exciting the secondary, while the leakage flux acts only to cut down the primary current. Any primary turn is of greater efficiency the larger the ratio is between the effective and the leakage flux linking the turn. This greater efficiency of some turns of the primary over others will depend upon their position upon the magnetic core with respect to the secondary coil. I have accordingly placed the coils 5 and 6, which are always in circuit, at the ends of the primary leg 4 of the core, and in a position upon the magnetic circuit closest to the high potential secondary 14, giving the coils 5 and 6 the position of highest efficiency. The regulating coils 10, which are not always in use, are placed on the magnetic circuit at a greater distance from the secondary windings than the windings 5 and 6, and consequently in a position of less efficiency. The effect of throwing the coils 10 into the circuit will not only lessen the ratio of voltage transformation between the secondary and the primary, but the greater leakage flux of the windings 10 will cause them to act in the nature of a choke coil in the primary circuit and very efficiently act to control the amount of energy drawn from the supply mains. By moving the primary regulator so as to include more or less of the primary coils 10 the turns of the primary winding, and thus its impedance, may be increased or diminished so as to vary the amount of current flowing through the primary winding.

The main secondary winding 14 of the transformer is mounted upon the leg 3 of the core and is connected, by wires 15 and 16, with the spark gap 17.

The primary winding consists of a comparatively few turns of wire, and the secondary winding of a greater number of turns, so that the transformer acts as a step-up transformer to step-up the primary voltage to a high tension secondary potential. By placing the primary and secondary windings upon different legs of the transformer core, they are more completely separated and better insulated from each other to guard against any possible break-down between the primary and secondary.

A condenser 18 is connected with the wire 16 by a wire 22, at one terminal, and the other terminal of the condenser is connected by a wire 19, with the primary winding 20 of the Tesla coil. The winding 20 is connected at its other terminal, by a wire 21, with the other side of the spark gap 17. By this arrangement the condenser is alternately charged and discharged through the winding 20 of the Tesla coil, and the discharges have the oscillatory character due to the use of the condenser and the spark gap.

In order to vary the frequency of the oscillatory discharges so as to modify the character of the currents produced by the Tesla coil, the condenser is arranged to have a variable capacity which is regulated by means of a frequency-regulator 23. This regulator comprises a conductive sector which may be rotated into position to connect together or disconnect a number of condenser plates of the same set as the uppermost plate, which plate is normally connected with the spark gap through the wire 22. In this way a greater or less number of plates is rendered operative and the capacity of the condenser and, consequently, its rate of charge and discharge is thus regulated.

The terminals of the secondary winding 24 of the Tesla coil are connected, by conductors 25 and 26, with the members of a the same sense as the coils 5. From the coils 6 the current passes through a wire 9 to a series of primary coils 10 arranged between the coils 5 and 6. Each of the coils 10 has an independent connection with one of the contact points of the primary regulator 11, and the movable contact member of the primary regulator is connected, by a wire 12, with the other supply terminal 13.

The above-described arrangement of primary coils constitutes means for varying the amount of current passing through the primary windings and energizing the transformer. When fewer turns are used in the primary winding the ratio of transformation between the secondary and primary voltages will be increased, the secondary winding being more strongly energized and forcing more current through the different external circuits connected thereto, and the primary will in consequence admit a greater primary current from the supply mains. When less energy is desired, more turns are used in the primary winding and the ratio between the secondary and the primary voltages is diminished, the result being that the secondary voltage is lessened, and less current forced through the various secondary circuits, with consequent diminution of the amount of current drawn by the primary from the supply mains. The impedance of any turn of the primary winding will be due to its own ohmic resistance and to the magnetic flux which links said turn. The magnetic lines which link both the primary and secondary and constitute the effective flux made up one component of the total flux linking said turn of the primary, and the impedance due to this component of the flux will vary with the impedance of the secondary circuit. Another component of the total flux is the leakage flux, or the magnetic lines linking said turn which do not cut the secondary windings, and the impedance due to the leakage flux is not dependent upon the impedance of the secondary circuit. The effective flux does useful work in exciting the secondary, while the leakage flux acts only to cut down the primary current. Any primary turn is of greater efficiency the larger the ratio is between the effective and the leakage flux linking the turn. This greater efficiency of some turns of the primary over others will depend upon their position upon the magnetic core with respect to the secondary coil. I have accordingly placed the coils 5 and 6, which are always in circuit, at the ends of the primary leg 4 of the core, and in a position upon the magnetic circuit closest to the high potential secondary 14, giving the coils 5 and 6 the position of highest efficiency. The regulating coils 10, which are not always in use, are placed on the magnetic circuit at a greater distance from the secondary windings than the windings 5 and 6, and consequently in a position of less efficiency. The effect of throwing the coils 10 into the circuit will not only lessen the ratio of voltage transformation between the secondary and the primary, but the greater leakage flux of the windings 10 will cause them to act in the nature of a choke coil in the primary circuit and very efficiently act to control the amount of energy drawn from the supply mains. By moving the primary regulator so as to include more or less of the primary coils 10 the turns of the primary winding, and thus its impedance, may be increased or diminished so as to vary the amount of current flowing through the primary winding.

The main secondary winding 14 of the transformer is mounted upon the leg 3 of the core and is connected, by wires 15 and 16, with the spark gap 17.

The primary winding consists of a comparatively few turns of wire, and the secondary winding of a greater number of turns, so that the transformer acts as a step-up transformer to step-up the primary voltage to a high tension secondary potential. By placing the primary and secondary windings upon different legs of the transformer core, they are more completely separated and better insulated from each other to guard against any possible break-down between the primary and secondary.

A condenser 18 is connected with the wire 16 by a wire 22, at one terminal, and the other terminal of the condenser is connected by a wire 19, with the primary winding 20 of the Tesla coil. The winding 20 is connected at its other terminal, by a wire 21, with the other side of the spark gap 17. By this arrangement the condenser is alternately charged and discharged through the winding 20 of the Tesla coil, and the discharges have the oscillatory character due to the use of the condenser and the spark gap.

In order to vary the frequency of the oscillatory discharges so as to modify the character of the currents produced by the Tesla coil, the condenser is arranged to have a variable capacity which is regulated by means of a frequency-regulator 23. This regulator comprises a conductive sector which may be rotated into position to connect together or disconnect a number of condenser plates of the same set as the uppermost plate, which plate is normally connected with the spark gap through the wire 22. In this way a greater or less number of plates is rendered operative and the capacity of the condenser and, consequently, its rate of charge and discharge is thus regulated.

The terminals of the secondary winding 24 of the Tesla coil are connected, by conductors 25 and 26, with the members of a spark gap 27, which is adjustable, in the ordinary manner, by means of a sliding rod 28.

In place of connecting the primary and secondary windings of the Tesla coil with the earth in the usual manner, the lowermost plate 29 of the condenser 18 is connected, by a wire 30, with the wire 12 connected with the primary winding of the transformer and with the supply system by which the apparatus is energized. This arrangement constitutes in general the equivalent of a ground made in the ordinary manner, but it has advantages which will be hereinafter pointed out.

Currents of the characters usually employed in therapeutics and derived from a high-frequency coil are derived from the Tesla coil 2 in the present invention, either from the terminals of the spark gap 27 or by other connections illustrated in Fig. 1. A current of the character usually designated as a d'Arsonval current is obtained through terminals connected, by wires 32, 33 and 26, with a portion of the secondary winding 24. This portion is made of heavier wire than the rest of the secondary winding, and the arrangement is such that the d'Arsonval current supplied in this manner is of lower tension but greater volume than the current generated in the Tesla secondary as a whole. A current of high frequency but of lower tension than that produced in the secondary winding 24 is obtained through terminals connected by wires 34 and 35 with the terminals of the primary winding 20 of the Tesla coil. This current may be designated as a thermo-faradic current.

In addition to the high-tension and high-frequency currents above referred to, the apparatus is arranged to supply alternating currents of comparatively low tension and of the frequency of the alternating current by which the apparatus is energized. One of these currents, which may be designated as a sinusoidal current, and which is designed for direct personal application, is induced in an auxiliary secondary winding 36 in the transformer 1, and this secondary winding, for reasons which will be hereinafter pointed out, is located upon the same leg of the core as the primary winding of the transformer and is interposed between the coils of the primary winding. The sinusoidal current is obtained from terminals connected, by wires 37 and 38, with the terminals of the winding 36.

In addition to the currents above described for direct application, the apparatus is designed to furnish currents for indirect use, such currents being adapted for the operation of cauterizing apparatus and diagnostic lamps. The current for the diagnostic lamp is obtained from terminals which are connected, through wires 38, 39 and 40, and through a variable resistance device 41, with the secondary winding 36. The connections are arranged as shown in Fig. 1 so that in the production of this current only a portion of the winding 36 is employed, so that the lamp current is of lower tension than the sinusoidal current. The variable resistance device 41 constitutes a regulator for the diagnostic lamp.

The cautery current is obtained from another auxiliary secondary winding, 42, arranged adjacent to the winding 36. This winding 42 is so proportioned as to produce a current of very low tension, which may be safely used for the purpose designated. The cautery current is obtained from terminals connected with the winding 42 by means of wires 43 and 44.

To furnish at all times an indication when the transformer is in operation, a small electric lamp 45, designated as a pilot light, is connected across the wires 42 and 43 and this lamp glows whenever there is any flow of current in the primary winding of the transformer.

The mechanical construction of the apparatus may now be considered. This is most fully disclosed in Fig. 5 of the drawings, which shows a plan view of the interior arrangements of the apparatus. As shown in Fig. 5, the primary windings 5 and 6 each constitute two separately-wound coils. Owing to this arrangement and to the further division of the primary winding into the separately-wound coils 10, the entire primary winding of the transformer is divided into a large number of small sections. It has previously been common to arrange the secondary winding of an induction coil or high-tension transformer in separate sections in this manner, for the purpose of securing better insulation, but so far as I am aware the arrangement is novel in connection with the primary winding of a transformer or coil. The utility of this arrangement results from the production in high-frequency apparatus of static currents and waves of very high tension and of incidental character, which have a serious tendency to escape from the circuits of the apparatus and to leap considerable air spaces in preference to following conductors of high impedance. Such waves or currents occur in primary winding of the transformer and it has been found that in the absence of special precaution there is danger of the disruptive discharge of such currents through the primary and the consequent breaking down of the insulation therein, leading to the production of destructive arcs. I have found, however, that by winding the primary in separate coils or sections as above described, the insulation of the primary winding is so improved as to protect it against the effects which I have described.

spark gap 27, which is adjustable, in the ordinary manner, by means of a sliding rod 28.

In place of connecting the primary and secondary windings of the Tesla coil with the earth in the usual manner, the lowermost plate 29 of the condenser 18 is connected, by a wire 30, with the wire 12 connected with the primary winding of the transformer and with the supply system by which the apparatus is energized. This arrangement constitutes in general the equivalent of a ground made in the ordinary manner, but it has advantages which will be hereinafter pointed out.

Currents of the characters usually employed in therapeutics and derived from a high-frequency coil are derived from the Tesla coil 2 in the present invention, either from the terminals of the spark gap 27 or by other connections illustrated in Fig. 1. A current of the character usually designated as a d'Arsonval current is obtained through terminals connected, by wires 32, 33 and 26, with a portion of the secondary winding 24. This portion is made of heavier wire than the rest of the secondary winding, and the arrangement is such that the d'Arsonval current supplied in this manner is of lower tension but greater volume than the current generated in the Tesla secondary as a whole. A current of high frequency but of lower tension than that produced in the secondary winding 24 is obtained through terminals connected by wires 34 and 35 with the terminals of the primary winding 20 of the Tesla coil. This current may be designated as a thermo-faradic current.

In addition to the high-tension and high-frequency currents above referred to, the apparatus is arranged to supply alternating currents of comparatively low tension and of the frequency of the alternating current by which the apparatus is energized. One of these currents, which may be designated as a sinusoidal current, and which is designed for direct personal application, is induced in an auxiliary secondary winding 36 in the transformer 1, and this secondary winding, for reasons which will be hereinafter pointed out, is located upon the same leg of the core as the primary winding of the transformer and is interposed between the coils of the primary winding. The sinusoidal current is obtained from terminals connected, by wires 37 and 38, with the terminals of the winding 36.

In addition to the currents above described for direct application, the apparatus is designed to furnish currents for indirect use, such currents being adapted for the operation of cauterizing apparatus and diagnostic lamps. The current for the diagnostic lamp is obtained from terminals which are connected, through wires 38, 39 and 40, and through a variable resistance device 41, with the secondary winding 36. The connections are arranged as shown in Fig. 1 so that in the production of this current only a portion of the winding 36 is employed, so that the lamp current is of lower tension than the sinusoidal current. The variable resistance device 41 constitutes a regulator for the diagnostic lamp.

The cautery current is obtained from another auxiliary secondary winding, 42, arranged adjacent to the winding 36. This winding 42 is so proportioned as to produce a current of very low tension, which may be safely used for the purpose designated. The cautery current is obtained from terminals connected with the winding 42 by means of wires 43 and 44.

To furnish at all times an indication when the transformer is in operation, a small electric lamp 45, designated as a pilot light, is connected across the wires 42 and 43 and this lamp glows whenever there is any flow of current in the primary winding of the transformer.

The mechanical construction of the apparatus may now be considered. This is most fully disclosed in Fig. 5 of the drawings, which shows a plan view of the interior arrangements of the apparatus. As shown in Fig. 5, the primary windings 5 and 6 each constitute two separately-wound coils. Owing to this arrangement and to the further division of the primary winding into the separately-wound coils 10, the entire primary winding of the transformer is divided into a large number of small sections. It has previously been common to arrange the secondary winding of an induction coil or high-tension transformer in separate sections in this manner, for the purpose of securing better insulation, but so far as I am aware the arrangement is novel in connection with the primary winding of a transformer or coil. The utility of this arrangement results from the production in high-frequency apparatus of static currents and waves of very high tension and of incidental character, which have a serious tendency to escape from the circuits of the apparatus and to leap considerable air spaces in preference to following conductors of high impedance. Such waves or currents occur in primary winding of the transformer and it has been found that in the absence of special precaution there is danger of the disruptive discharge of such currents through the primary and the consequent breaking down of the insulation therein, leading to the production of destructive arcs. I have found, however, that by winding the primary in separate coils or sections as above described, the insulation of the primary winding is so improved as to protect it against the effects which I have described.

The arrangement of the primary winding of the transformer is such that the intermediate coils 10, when they are not included in the primary circuit, tend to act as secondary coils with relation to the main coils 5 and 6, precisely after the manner of an auto-transformer that is to say, a potential in the coils 10 is induced by the magnetic flux in the core due to the action of the coils 5 and 6. This potential is opposite to that of the alternating current by which the primary winding is energized, and when the coils 10 are not connected in series with the main coils the difference in potential between the left-hand coil 10 and the adjacent right-hand coil 5 is much higher than any difference in potential due to the energizing current alone. To guard against evil effects from this circumstance, a plate 46 of insulating material is interposed between the coils 5 and the coils 10.

The control of the transformer by varying the amount of primary winding in operation is an economical method, since the flow of current is controlled not by waste of current in external heat-producing resistance devices such as are commonly used, but by the impedance in the primary winding itself. The control of the transformer is thus accomplished in an economical and effective manner without the use of any additional parts except the controlling switch, and the bulk of the apparatus is thus minimized.

The construction of the spark gap 17 is illustrated particularly in Fig. 8. This spark gap is provided with an adjustable member 49 which has a flat face covered by a thin plate of silver. The disruptive discharge between the spark-gap members heats them and causes their surfaces to oxidize. I have found that a metal of which the oxid so produced is electrically-conductive operates in a much more uniform and satisfactory manner than a metal of which the oxid acts as an insulating medium, and for this purpose I have found that silver is well adapted, since its oxid has the required conductivity. The member 49 is adjustable toward and from the other member of the spark gap, and to this end is mounted upon a screw 50 which is in threaded engagement with a metal sleeve 51. The outer end of the screw 50 is provided with a head 52 by means of which it may be turned to adjust the member 49 and vary the length of the spark.

To prevent over-heating of the spark-gap member, the sleeve 51 is provided with heat-radiating flanges 53. The sleeve 51 is mounted upon a plate 55 which engages a slot passing through the flanges 53, as shown particularly in Fig. 9. This plate 55 is fixed upon a porcelain block 47 which forms a base for the spark gap. The plate 55 has a resilient tongue 56 which normally springs upwardly above the plane of the body of the plate so as to engage the foremost flange 53 and prevent this flange, and therefore the spark-gap member, from sliding outwardly upon the plate 55. When it is desired, however, to remove the parts from their normal position, the tongue 56 may be pressed downward into line with the slot in the radiating flanges and the parts may then be withdrawn through an opening provided for this purpose in the front of the casing of the apparatus.

To shield the other parts of the apparatus from the heat and the fumes produced by the discharge through the spark gap, vertical walls 48 of insulating material are fixed to the sides of the porcelain base 47, and as shown in Figs. 3 and 4, an opening is provided through the top of the casing both to allow inspection of the spark gap and to provide for the escape of heated fumes.

The fixed member 60 of the spark gap is similar in form to the adjustable member 49 and is also provided with heat-radiating flanges. This member is mounted in a similar manner upon a fixed plate 62 having a retaining tongue 63 similar to the retaining tongue 56 above described.

To maintain a good electrical connection between the adjusting screw 50 and the sleeve 51, a screw-threaded ring 57 is mounted upon the screw and is provided with two rearwardly-projecting pins 58 which loosely engage openings in the sleeve. The spring-pressed member or ring 57 is prevented from rotation with the adjusting screw 50 by means of the said pins 58. Spiral springs surround the pins and force the threaded ring 57 constantly against the threads of the screw 50 with sufficient pressure to maintain a close electrical contact and also to prevent accidental rotation of the adjusting screw 50 due to vibrations in the apparatus. The female screw threads of the spring-pressed ring 57 press forwardly against the male screw threads of the screw 50, while the female screw threads of the sleeve 51 resist this pressure by holding back against the male threads of the screw 50. Thus the screw 50 is engaged by two oppositely pressing screw-threaded members, viz., the ring 57 and the sleeve 51, which insures a constant longitudinal pressure between the threads of the screw 50 and the threads of the ring 57 and sleeve 51 whereby a close electrical contact is maintained and the screw 50 is prevented from turning too easily.

The plates 54 and 62 are provided with connection members 59 by which they are connected with the wires from the secondary winding of the transformer 1.

The construction of the primary regulator 11 is illustrated particularly in Fig. 7. This device is provided with a base 64 of insulating material, and for this purpose I have found porcelain to be particularly adapted. Mounted at the center of the base is a vertical stem 65 having a squared upper end upon which is mounted an operating handle or knob 69. The end 68 of the stem is bifurcated so as to afford a resilient engagement with the square socket in the handle, operating to maintain the handle frictionally in place while permitting it to be readily disengaged when necessary.

The stem 68 is journaled in a sleeve 61 and the sleeve is secured in place and connected with the conductor 12 by means of a nut 71 threaded upon the sleeve. A spiral spring 66 engages at one end the nut 71 and at its other end the collar 67 fixed on the stem 68. This spring operates to maintain constantly a good electrical connection between the stem and the nut 71 and conductor 12. The stem 68 carries at its lower end a metal arm 70 bearing a contact button. The contact button may be moved, by rotating the stem 68, into engagement with either of a series of spring-pressed contact members 72 which are mounted in the base 64, and in this way the conductor 12 may be connected alternatively, as indicated in Fig. 1, with the wires connected with the primary coils 10. The connections between the coils 10 and the contact members 72 are illustrated in Fig. 5. To retain the primary controller in its several positions, a plate of insualting material 73 is mounted upon the stem 68 and is engaged by a spring-pressed ball 74 mounted on the base 64. By means of suitable recesses in the upper surface of the plate 73, the retainer may be caused to arrest the motion of the regulator at points where the contact members are squarely in engagement with each other. The spring 66 permits the stem to yield vertically and thereby facilitates the disengagement of the recesses from the retainer when the regulator is moved from contact to contact.

It is desirable to prevent retrograde movement of the primary regulator by which it might be turned so as to throw the transformer into full operation at once, and for this purpose a spring-pressed member 103, similar in construction to the contact members 72, is mounted in such position that it will engage a shoulder 104, shown in dotted lines in Fig. 5, upon the plate 73. The position of the parts is such as to arrest the contact arm 70 if it be attempted to turn it backward into engagement with the last of the series of contact members 72 by which the direct connection is made between the conductor 12 and the wire 9.

Owing to the large number of circuits and connections necessary in an apparatus of the present character, it is difficult and inconvenient to make the necessary connections through or upon the base-board or the casing of the apparatus in the ordinary manner and I have, therefore, devised an arrangement by which the connections of the various portions of the apparatus are simplified, this arrangement being such also as to permit the removal of the cover of the apparatus without the manipulation of any of the connections so that access may be readily and conveniently had to the interior parts of the apparatus for purposes of examination and repair.

To the above ends I provide the casing of the apparatus with a member upon which the various exterior terminals of the apparatus are mounted and, provide this member with conductors arranged to normally engage corresponding fixed conductors mounted in the casing. When this connection member is removed the conductors are separated, while when the said member is replaced in position, the conductors are thereby engaged, and in this manner the terminals are connected with the interior parts of the apparatus without attention on the part of the operator.

The connection member is embodied, in the illustrated apparatus, in a plate or board 81 of wood or other non-conducting material which normally covers the apparatus, with the exception of the Tesla coil 2, and this board is normally secured in place by means of screws 93. The board 81, which I shall hereinafter designate as the "connection-member," carries, with one exception, the exterior terminals 83 through which the d'Arsonval, thermo-faradic and sinusoidal currents are derived and also the terminals for the diagnostic lamp and the cautery current. These various terminals are connected, by means of wires and other conductors shown principally by dotted lines in Fig. 4, with a number of contact devices 105 fixed to the bottom of the board. The contact devices 105 are arranged in a line in such position as to be directly above a cross bar 77 fixed in the casing of the apparatus directly beneath the connection-member. This cross bar 77 is made of wood or other non-conducting material and it carries contact devices 78 in the form of flat metal plates arranged in position to engage the contact devices 105 when the connection-member is in position. To insure a good contact between the contact devices 78 and 105, the former are provided with threaded stems 80 which project upwardly through the connection-member and are provided with nuts 92 by which the board is drawn firmly down into position.

When the nuts 92 and the screws 93 are removed the connection-member may be freely removed from the casing thereby automatically disconnecting all of the external terminals from the apparatus, and when the connection-member is replaced the circuits are automatically restored again by the operation of the contact devices 78 and 105.

In addition to the external terminals and their connections, the connection-member carries a socket 85 for the reception of one of the pillars 102 of the spark gap of the Tesla coil. This socket 85 is provided with an annular recess 86 for the reception of the tubular pillar and with a central metal conductor 87 constituting a portion of the conductor 26 illustrated diagrammatically in Fig. 1. The regulator 41 for the diagnostic lamp is also carried by the connection-member 81. This regulator comprises a stem 88 provided with a handle 99 of the same form as the handle 69 of the primary regulator. The stem 88 is journaled in a plate 89 of insulating material and carries a conductive cross-arm 90 which engages the several contacts 91 of the resistance coil by which the strength of current in the lamp is regulated. The socket 82 for the pilot lamp 45 is also carried upon the connection-member.

The construction of the frequency-regulator 23 is similar in general to that of the primary controller 11 except that the frequency-regulator is provided with a sector of conducting material adapted to engage simultaneously any number of the spring-pressed contacts 106, as indicated diagrammatically in Fig. 1. The frequency-controller is provided with a knob or handle 98 similar to the knob 69 of the primary regulator.

The conductor 25, connecting the secondary winding of the Tesla coil with the spark gap 27, passes through a pillar 102 mounted in a socket 100 similar to the socket 85 already described.

The entire apparatus is covered by a plate 94 of rubber or other insulating material, and collars 95, threaded to the sockets 85 and 100 are screwed down upon the upper surface of this plate. The sockets are arranged to project well above the apparatus to prevent discharges from the pillars to the parts below the sockets. The terminals 83, etc., are covered by caps 96 of insulating material so that there are no exposed conductors from which accidental shocks may be obtained. The terminals 7 and 13 of the primary winding of the transformer are located in a socket 101, through which connection may be made with a screw plug, in the ordinary manner, to introduce the alternating current by which the apparatus is energized.

The arrangement of the apparatus throughout is such as to prevent, so far as possible, accident either to the operator or to the apparatus itself due either to internal derangements in the apparatus or to careless handling on the part of the operator. One means has already been described by which disruptive discharges in the primary winding of the transformer are prevented. In this connection, however, the supplemental plate 29 of the condenser, hereinbefore described, serves as an additional safeguard, since, without constituting an actual metallic connection between the transformer and the high-tension portions of the apparatus, it operates in the manner of a ground to afford an outlet for the static waves or impulses which might otherwise find a way through the primary winding. It also prevents severe shocks to the operator which might occur in the absence of such precaution in case his body should accidentally come in contact both with a terminal of the Tesla coil and with a ground connection of any kind.

The general form of the transformer is in itself a protection against the action of the high-tension oscillatory currents generated, since it permits a sufficient separation of the primary and secondary windings to prevent occurrence of disruptive discharges from the secondary winding through the primary winding. This form of transformer has thus peculiar advantages when used in connection with a condenser and a spark gap to produce oscillatory currents of high tension, and such an arrangement is novel so far as I am informed.

A further advantage resulting from the arrangement of the main primary coils 5 and 6 at the extremities of the leg 4 of the transformer core resides in the fact that the principal portions of the primary winding are thus brought as close as possible to the secondary winding, so that the magnetic paths connecting the primary and secondary windings are thus of the shortest possible length and thus efficiency and economy in the operation of the transformer are secured. This arrangement also permits the location of the primary-regulating coils 10 at a point where their inductive effect is slight, so that the impedance of these coils may act more effectively to regulate the production of current in the secondary winding.

The arrangement of the transformer with a plurality of independent secondary windings adapted to generate currents of different volumes and tensions permits the use of a single transformer for a variety of purposes and thus greatly increases the usefulness of the apparatus without correspondingly increasing its bulk or expense. In this connection it will be noted that by suitably proportioning the several secondary windings, currents of any volumes and tensions within the extreme limitations of the apparatus may be secured. In the preferred embodiment of the invention I have found that for the production of the cautery current a winding of very few turns of heavy wire adapted to give a heavy current under an E. M. F. of about three volts gives satisfactory results while restricting the voltage to such low tension as to render it perfectly safe and convenient for use in cauterizing apparatus. In the diagnostic lamp, I find an E. M. F. of ten volts to be sufficient, while in the sinusoidal circuit I employ an E. M. F. of twenty-four volts and the winding 36 is, therefore, suitably proportioned to produce such voltages.

The position of the secondary windings 36 and 42 upon the same leg of the transformer as the primary windings is a novel feature of importance, since it secures economy in space by placing these secondary windings at a point where primary windings would have a comparatively low efficiency in exciting the secondary winding 14. Moreover, by placing the secondary windings 36 and 42 upon the same leg and between the two primary coils, a good magnetic linkage is obtained between these windings and the primary, with a correspondingly good efficiency of current transformation. The arrangement has a further advantage in that it removes the comparatively low-tension secondary windings from the neighborhood of the high-tension secondary winding 14 and thereby reduces the liability of disruptive discharges in the transformer.

A detail of construction by which the reception of dangerous shocks by a patient or operator is avoided consists in the use of entirely independent conductors, such as the wires 21 and 34, for connecting the thermo-faradic terminals and the spark gap 17 with the terminals of the Tesla coil primary 20, as shown diagrammatically in Fig. 1. With the connection so arranged, if either of the connections should become accidentally broken the result would be merely to disconnect the thermo-faradic terminals entirely from the apparatus. If, on the other hand, the wire 34 were united to the wire 21, or vice-versa, in place of the independent connections with the primary winding 20, a dangerous shock might result from accidental breakage of the common connection with the winding 20. In such an event the thermo-faradic terminals would constitute the only path for the discharge of the condenser, which discharge would pass through the person connected with these terminals, whereas in the normal operation of the apparatus the primary winding 20, which consists of very few turns of a heavy conductor, and therefore has comparatively low impedance, is connected in shunt with the thermo-faradic terminals so as to conduct the greater part of the discharge from the condenser.

Another danger to be guarded against in the operation of the apparatus resides in the possibility of connecting applicators to one of the d'Arsonval terminals and one of the thermo-faradic terminals, so as to put the patient or the operator into circuit with the secondary windings of both the transformer and the Tesla coil. Such a result may occur, for example, by using the right-hand d'Arsonval terminal and the upper thermo-faradic terminal in Fig. 1. To prevent danger from such a cause, the windings of the Tesla coil are so arranged and connected that in a circuit formed as above described they oppose each other, so that the resulting flow of current is equal to the difference and not to the sum of the currents which may be derived from either pair of terminals when properly connected. This arrangement also avoids a high difference in potential between the adjacent terminals of the primary and secondary windings of the Tesla coil.

As a further protection to the apparatus, the parts are so proportioned and arranged that a short-circuit, either in the spark gap 17 or in the sinusoidal diagnostic lamp or cautery terminals, cannot result in burning out the transformer. This is due partly to the form of the transformer in which the magnetic flux through the core is limited by suitably proportioning the end-pieces of the core, and also to the use of sufficient resistance in the secondary coils 36 and 42 and of a sufficiently small number of turns in these coils to prevent the overloading of the primary coils of the transformer.

While the various features of my invention are particularly susceptible to conjoint use in an apparatus of the kind hereinbefore referred to, since they all contribute to the production of a safe and reliable apparatus, it will be obvious that the invention in some of its aspects may be embodied in an apparatus from which some of the noted features are omitted.

The invention hereinbefore described is not limited to the embodiment specifically illustrated and described, but may be embodied in various other forms within the spirit of the invention and the scope of the following claims.

I claim—

1. An electro-therapeutic apparatus having, in combination, a transformer comprising a core having two substantially parallel legs connected by end-yokes, a secondary winding on one of said legs and a primary winding having main sections located near the ends of said leg and normally in operation, and a plurality of auxiliary sections located between the main sections, and a regulating device for controlling the operation of the transformer, the regulating device being arranged to throw more or less of the auxiliary primary sections into series with the main primary sections.

2. An electro-therapeutic apparatus hav-

ing, in combination, a transformer provided with a secondary winding and with a primary winding divided into two main sections connected in series and normally operative, and a plurality of auxiliary sections, a regulating device for controlling the operating of the transformer arranged to throw more or less of the auxiliary sections into series with the main sections of the primary winding, and a body of insulating material located between one of the said main sections and the adjacent auxiliary section, to prevent disruptive discharge between said sections.

3. An electro-therapeutic apparatus having, in combination, a high-tension transformer, a high-frequency coil energized thereby, a safety connection between the high frequency coil and the primary circuit of the high-tension transformer, and a condenser interposed in said connection.

4. An electro-therapeutic apparatus having, in combination, a high-tension transformer provided with a primary winding and a secondary winding, a high-frequency coil, a condenser, the high-frequency coil and the condenser being connected in series with the secondary winding of the high-tension transformer, and an independent auxiliary plate in said condenser connected with the primary circuit of the high-tension transformer and operating as a safety connection for the high-frequency coil.

5. An electro-therapeutic apparatus having, in combination, a high-tension transformer provided with a primary winding and a secondary winding, a high-frequency coil connected with and energized by the secondary winding of the transformer, and connections between the high-frequency coil and the primary circuit of the transformer constructed and operating as a safety connection between the high-frequency coil and said primary winding.

6. An electro-therapeutic apparatus having, in combination, a high-tension transformer provided with a primary winding and a secondary winding, and a condenser and a spark gap connected with said secondary winding, the spark gap having an adjustable member mounted upon an adjusting screw, and a spring-pressed member threaded upon the screw but prevented from rotating therewith, the spring-pressed member operating to preserve electrical contact between the screw and the fixed portion of the spark gap circuit.

7. An electro-therapeutic apparatus having, in combination, a high-tension transformer provided with a primary winding and a secondary winding, and a condenser and a spark gap connected with said secondary winding, the spark gap comprising a member provided with a plurality of heat-radiating flanges longitudinally slotted from their periphery inward, and a fixed plate engaging the flanges at their slotted portion and acting as a support for said member.

8. An electro-therapeutic apparatus having, in combination, a high-tension transformer provided with a primary winding and a secondary winding, and a condenser and a spark gap connected with said secondary winding, the spark gap comprising a member provided with a plurality of heat-radiating flanges longitudinally slotted from their periphery inward, and a fixed plate engaging the flanges at their slotted portion and acting as a support for said member, said plate having a resilient tongue engaging the face of one of the flanges to prevent longitudinal movement of the spark gap member upon the plate.

9. An electro-therapeutic apparatus, having, in combination, a Tesla coil provided with a secondary winding having a portion of greater conductivity than the remainder, and applicator terminals connected across said portion for the derivation of currents of greater volume and lower tension than the currents produced in the secondary winding as a whole.

10. An electro-therapeutic apparatus, having, in combination, a high-tension transformer, and a Tesla coil connected with and energized by the transformer and having an electrical connection between its primary and secondary windings, a pair of terminals adapted to receive applicator conductors connected across the primary winding, and a second pair of terminals adapted to receive applicator conductors connected across the secondary winding, the primary and secondary windings being wound in such direction that in a circuit formed between one of the primary applicator conductors and one of the secondary applicator conductors and passing through both primary and secondary windings and their connection, the primary and secondary windings will act in opposition to each other.

11. An electro-therapeutic apparatus, having, in combination, a Tesla coil having a primary and a secondary winding, terminals adapted to receive applicator conductors connected across the secondary winding, and a second set of terminals adapted to receive applicator conductors connected across a portion only of the secondary winding for the derivation of currents of greater volume and lower tension than the currents produced by the secondary winding as a whole.

12. An electro-therapeutic apparatus having, in combination, a high-tension transformer having a primary winding and a secondary winding, a high-frequency coil having a primary winding and a secondary winding, a condenser connected in series

with the secondary winding of the transformer and the primary winding of the coil, a spark gap connected in shunt with said primary winding condenser, and terminals adapted to receive applicator conductors connected with the terminals of the primary winding of the coil, the connections of the terminals which receive the applicator conductors being entirely independent of the other connections with said primary winding so as to prevent the conduction of excessive discharges through the applicator conductors in case of the breakage of any of such connections.

13. An electro-therapeutic apparatus having, in combination, a casing, means located in the casing for producing a high-frequency current of high tension, means located in the casing for producing a low-tension current adapted for energizing a cautery, connections for energizing said means from a common source external to the casing, and external terminals mounted on the casing for said high-tension and low-tension currents.

14. An electro-therapeutic apparatus having, in combination, transforming devices for producing a high-tension current and a low-tension current adapted for energizing a translating device, and a common regulator for regulating both of said currents simultaneously.

15. An electro-therapeutic apparatus having, in combination, a high-tension transformer provided with a primary winding, and a plurality of secondary windings, one of said secondary windings being constructed and arranged to produce a high-tension current, a condenser and spark gap connected with said winding to produce an oscillatory discharge, a Tesla coil comprising a primary and secondary, and having its primary connected in and energized by the high tension secondary winding of the transformer, a set of terminals connected with and energized by another of the transformer secondary windings, this winding being constructed and arranged to produce a current of comparatively low tension and of same frequency as the primary current, a second set of terminals connected across the primary of the Tesla coil for the derivation of an oscillatory current of low tension and large volume, a third set of terminals connected across a portion only of the secondary winding of the Tesla coil for the derivation of an oscillatory current of higher tension and smaller volume than that derived from the second set of terminals, and a fourth set of terminals connected across the entire secondary winding of the Tesla coil for the derivation of an oscillatory current of still higher tension and smaller volume.

16. An electro-therapeutic apparatus having, in combination, a high tension transformer provided with a primary winding, and a plurality of secondary windings, one of said secondary windings being constructed and arranged to produce a high tension current, a condenser and spark gap connected with said winding to produce an oscillatory discharge, a Tesla coil comprising primary and secondary windings, and having its primary connected to and energized by the high-tension secondary of the transformer, a set of terminals connected with and energized by another of the transformer secondary windings, this winding being constructed and arranged to produce a current of comparatively low tension, a second set of terminals connected across the primary winding of the Tesla coil for the derivation of an oscillatory current of comparatively large volume and low tension, and a third set of terminals connected across the secondary winding of the Tesla coil for the derivation of an oscillatory current of higher tension and smaller volume.

17. An electro-therapeutic apparatus having, in combination, a Tesla coil comprising primary and secondary windings, a set of applicator terminals connected across the primary for the derivation of an oscillatory current of comparatively large volume and low tension, and a second set of applicator terminals connected across the secondary Tesla coil for the derivation of an oscillatory current of comparatively small volume and high tension.

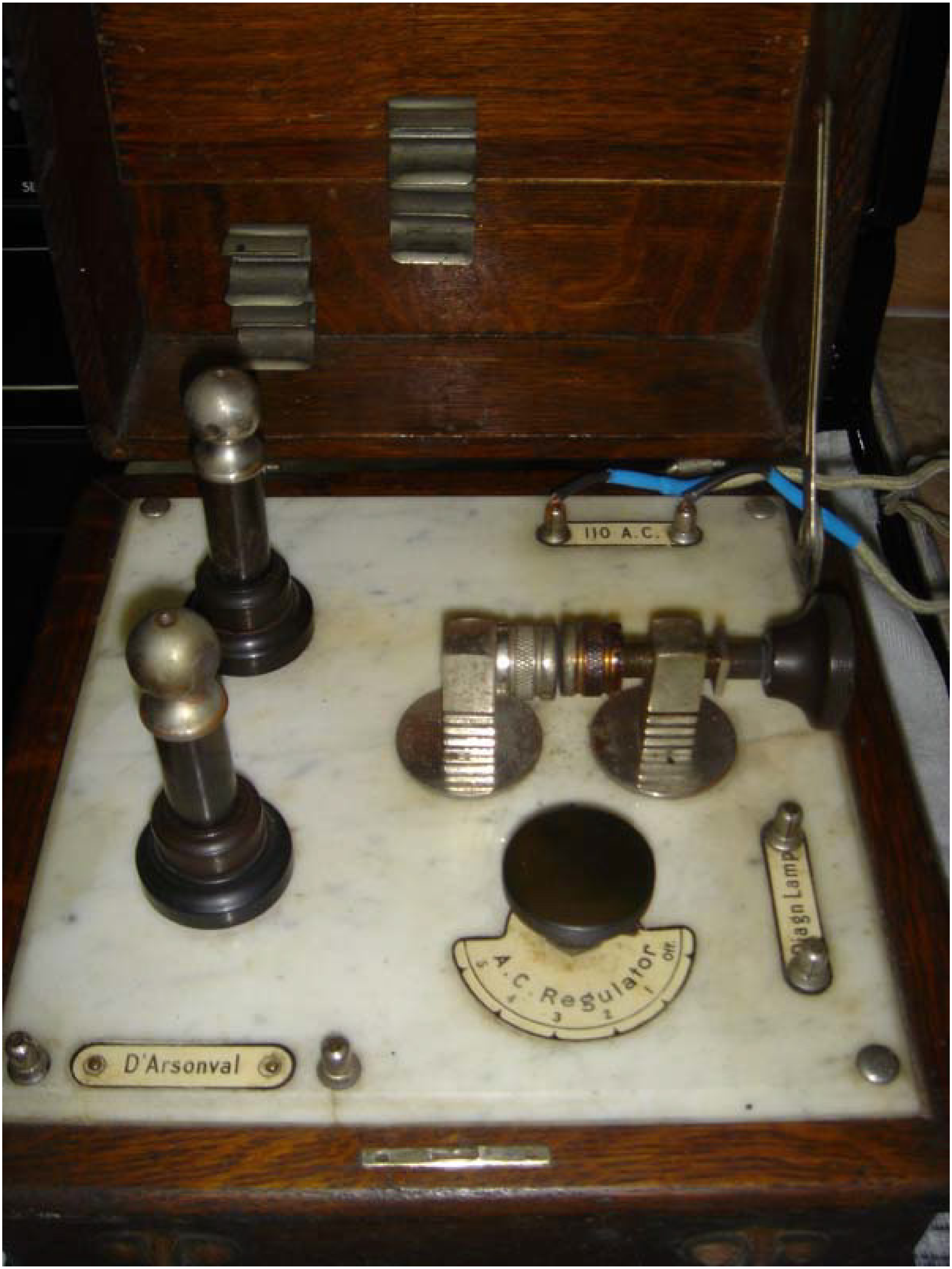
18. An electro-therapeutic apparatus having, in combination, a high-tension transformer provided with a primary winding and a plurality of secondary windings, one of said secondary windings being constructed and arranged to produce a high-tension current, a condenser and spark gap connected with said winding to produce an oscillatory discharge, a Tesla coil connected to and energized by this high-tension secondary winding of the transformer, a set of applicator terminals connected to the Tesla coil, and a second set of terminals connected with and energized by another of the transformer secondary windings, said windings being constructed and arranged to produce a current of comparatively low tension, a common means for regulating simultaneously the currents derived from both sets of terminals, and a second regulating means for regulating the current derived from the first set of terminals independently of the current derived from the second set.

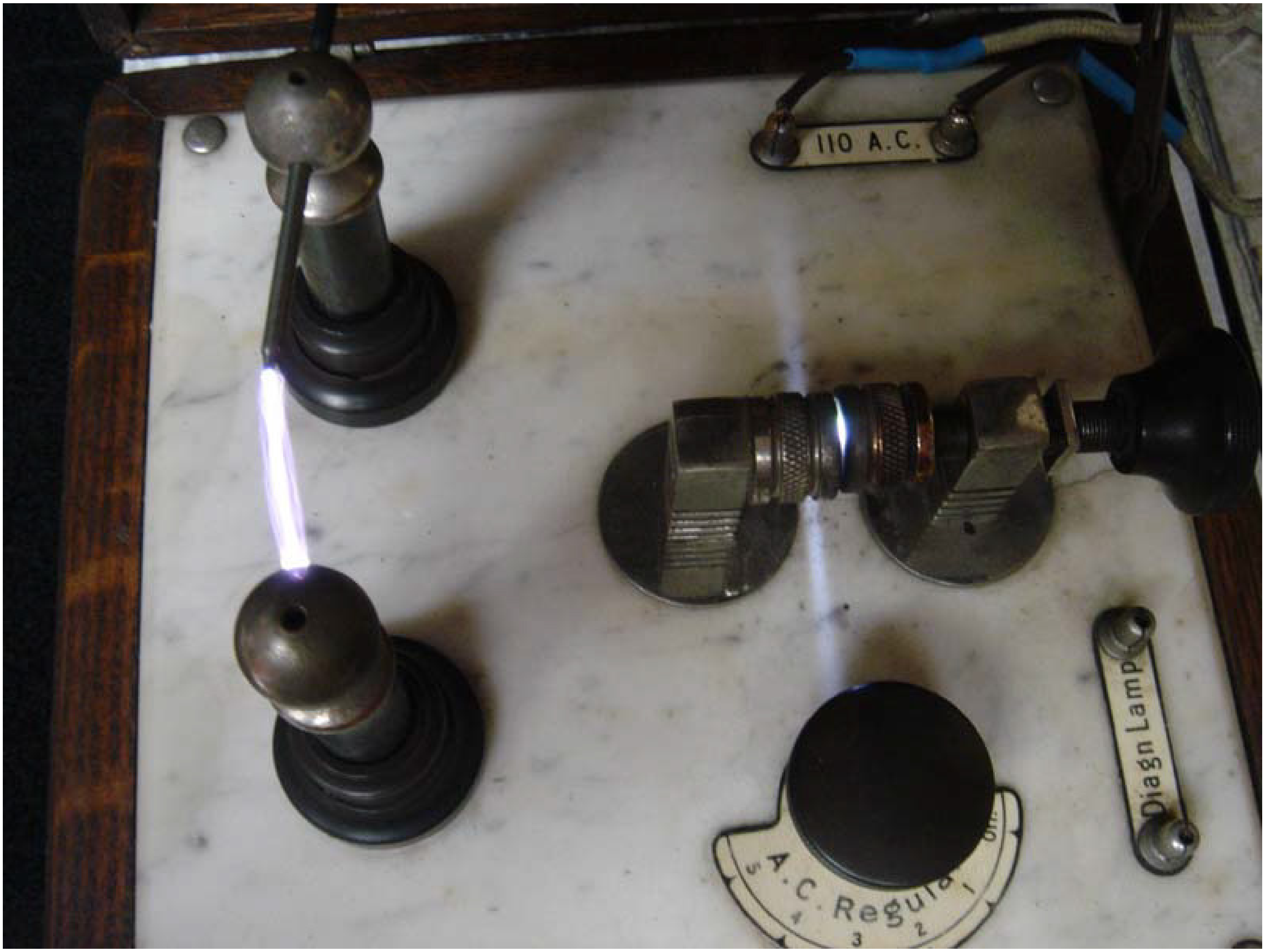
19. An electro-therapeutic apparatus having, in combination, a transformer provided with a primary winding, and a plurality of secondary windings, one of said secondary windings having a ratio of turns to the primary windings to produce a current of comparatively low tension, and another of

said windings having a ratio of turns to the primary winding to produce a high tension current, a condenser and spark gap, together with a Tesla coil, connected with said high-tension winding to produce an oscillatory discharge, this high-tension winding of the secondary being wound separately from and highly insulated from the first-mentioned secondary winding.

CHARLES E. CAMPBELL.

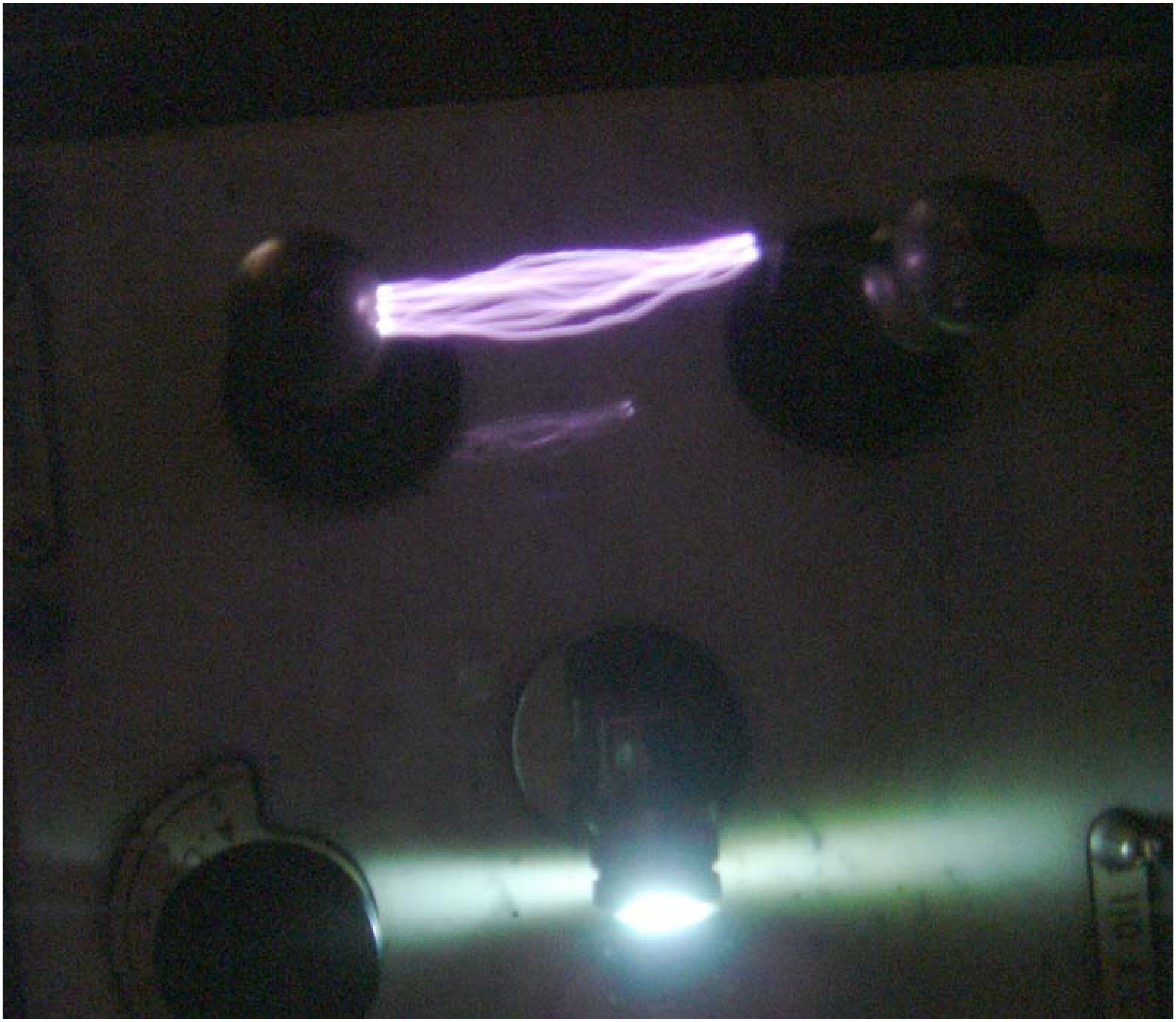
Witnesses:
HORACE VAN EVEREN,
A. ACKROYD.

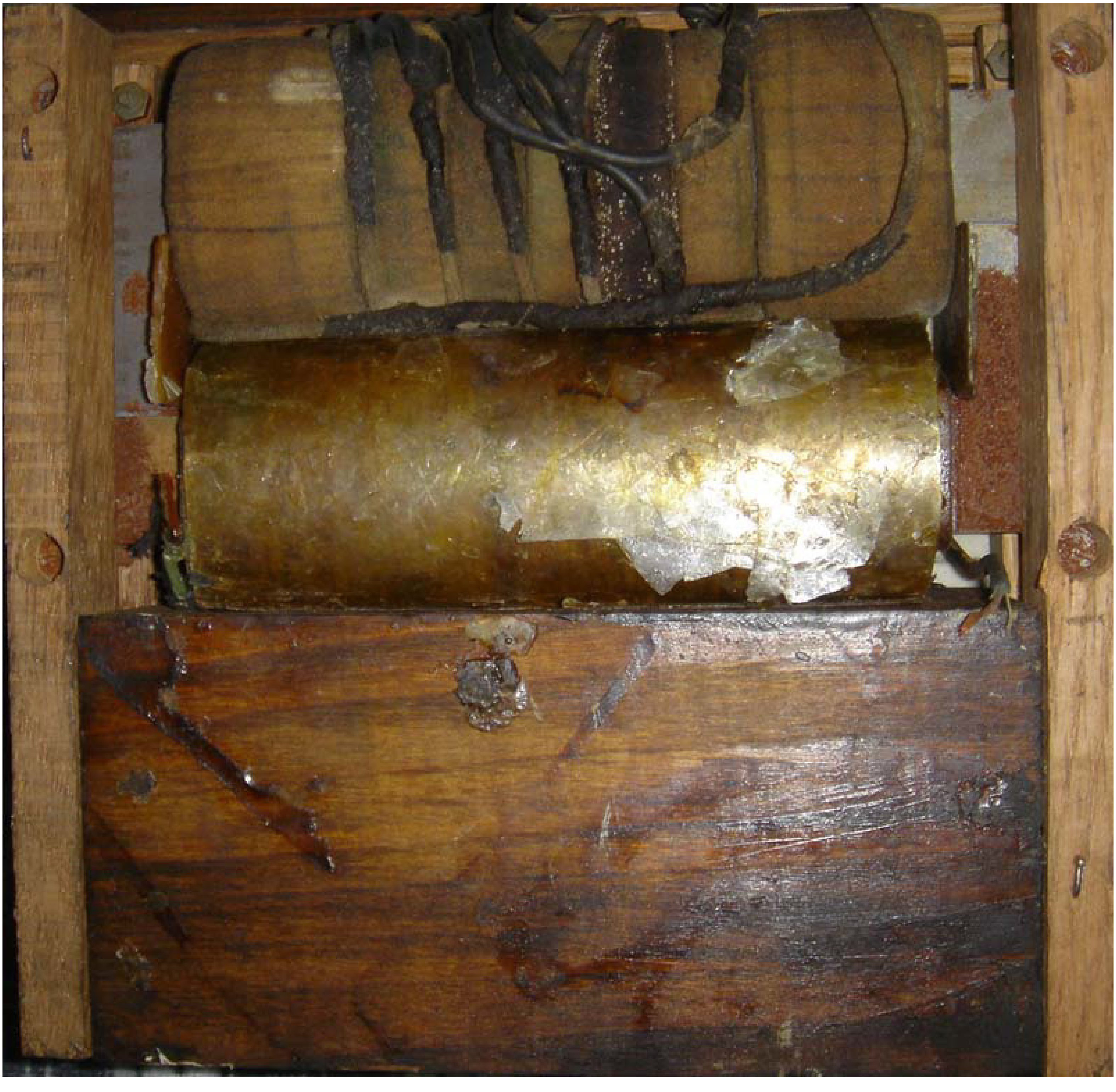

110 A.C.
A.C. Regulator
OFF
5 4 3 2 1
Diagn Lamp
D'Arsonval

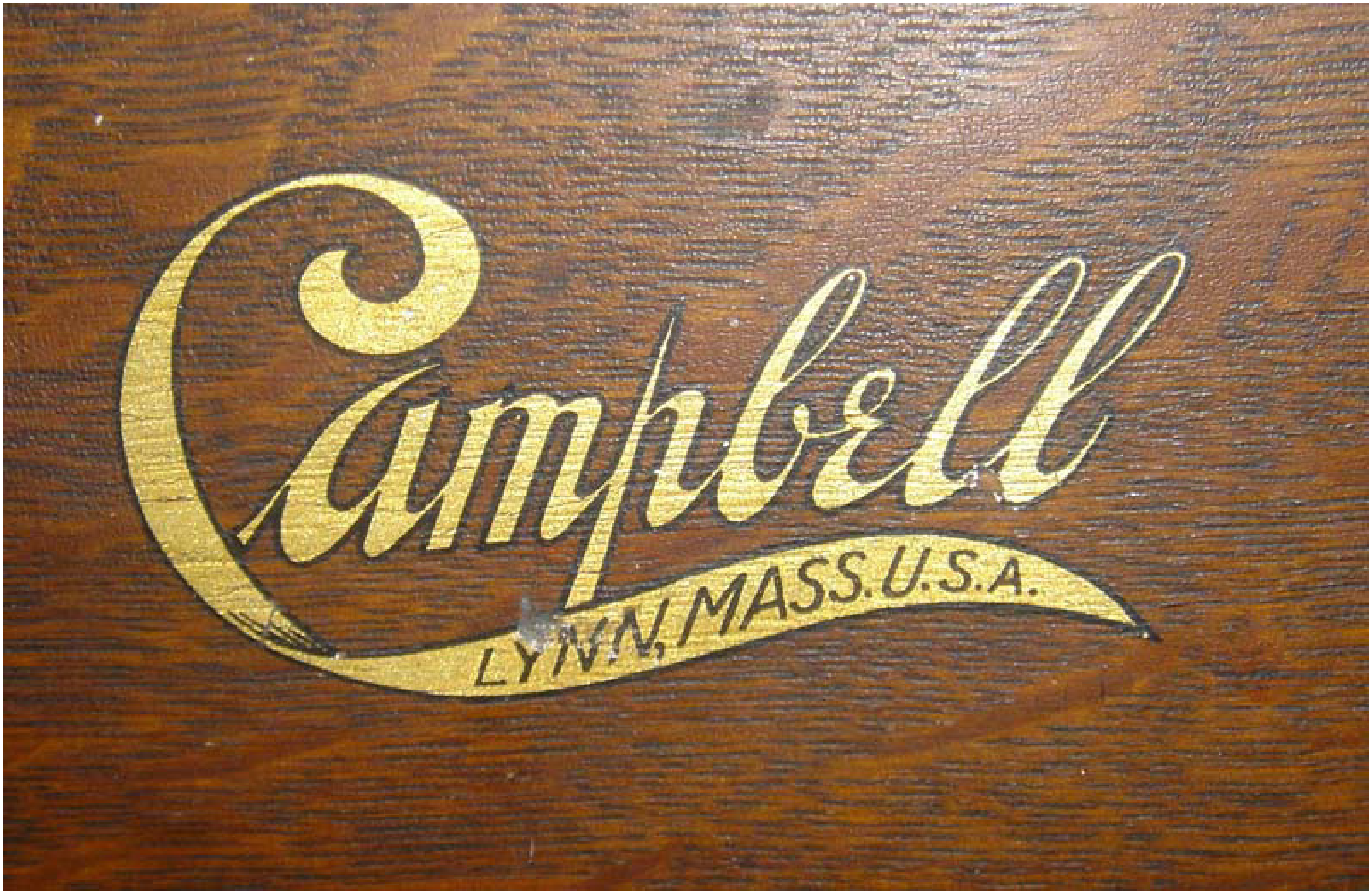

110 A.C.
Diagn Lamp
A.C. Regula
5 4 3 2 1

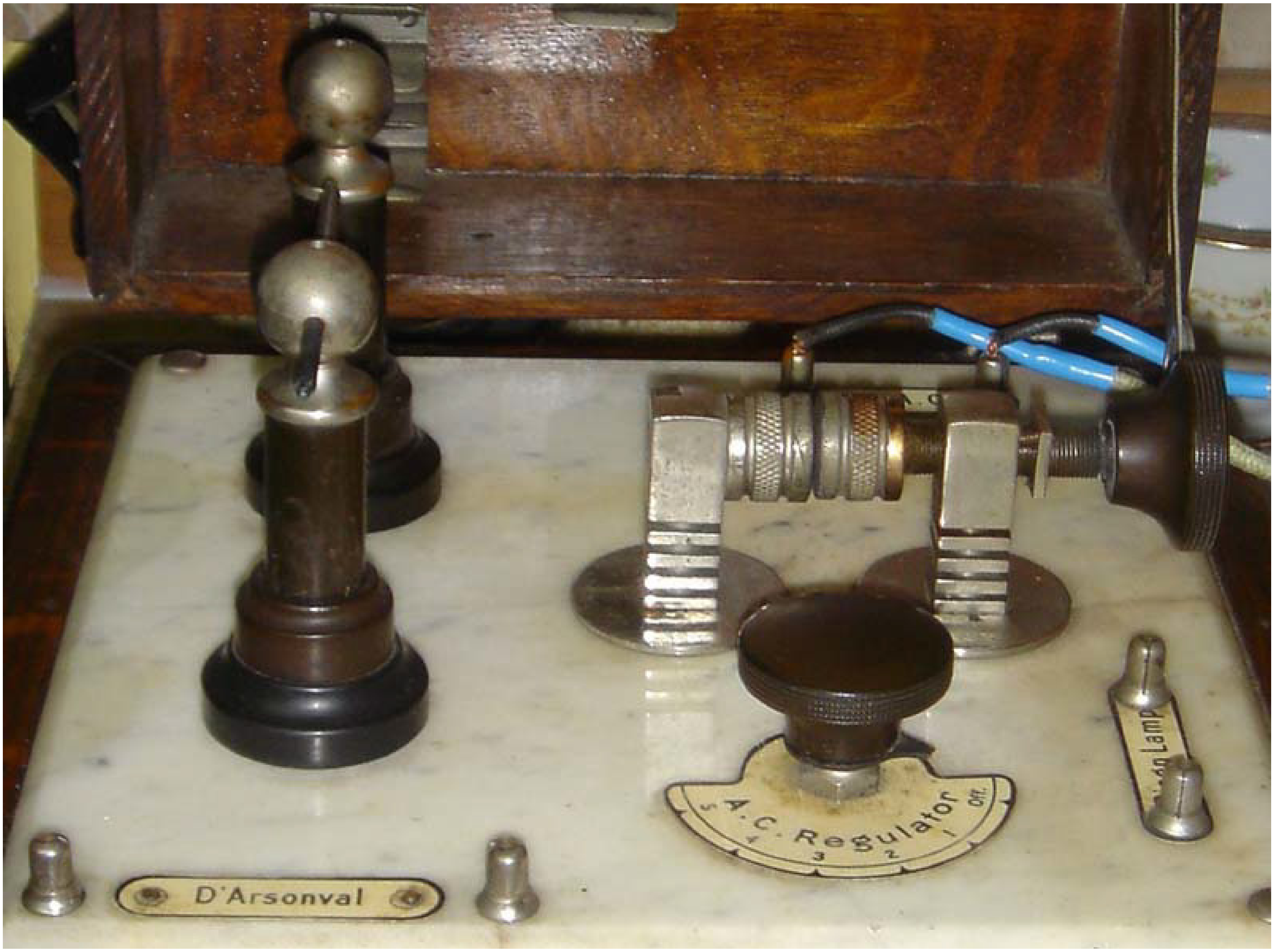
110 A.C.
Diagn Lamp

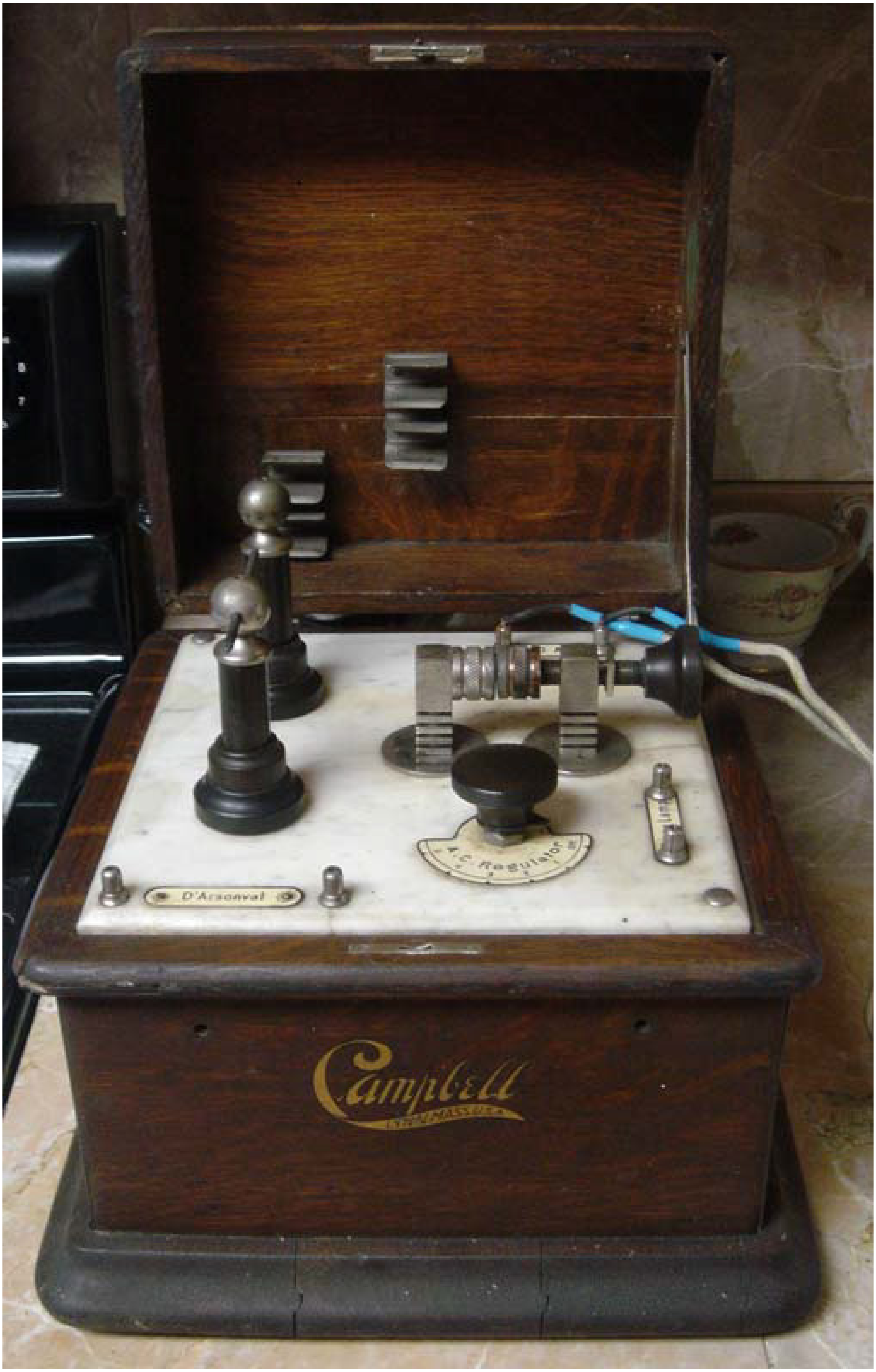
Diagn Lamp
110 A.C.
A.C. Regu
2
3
4
5

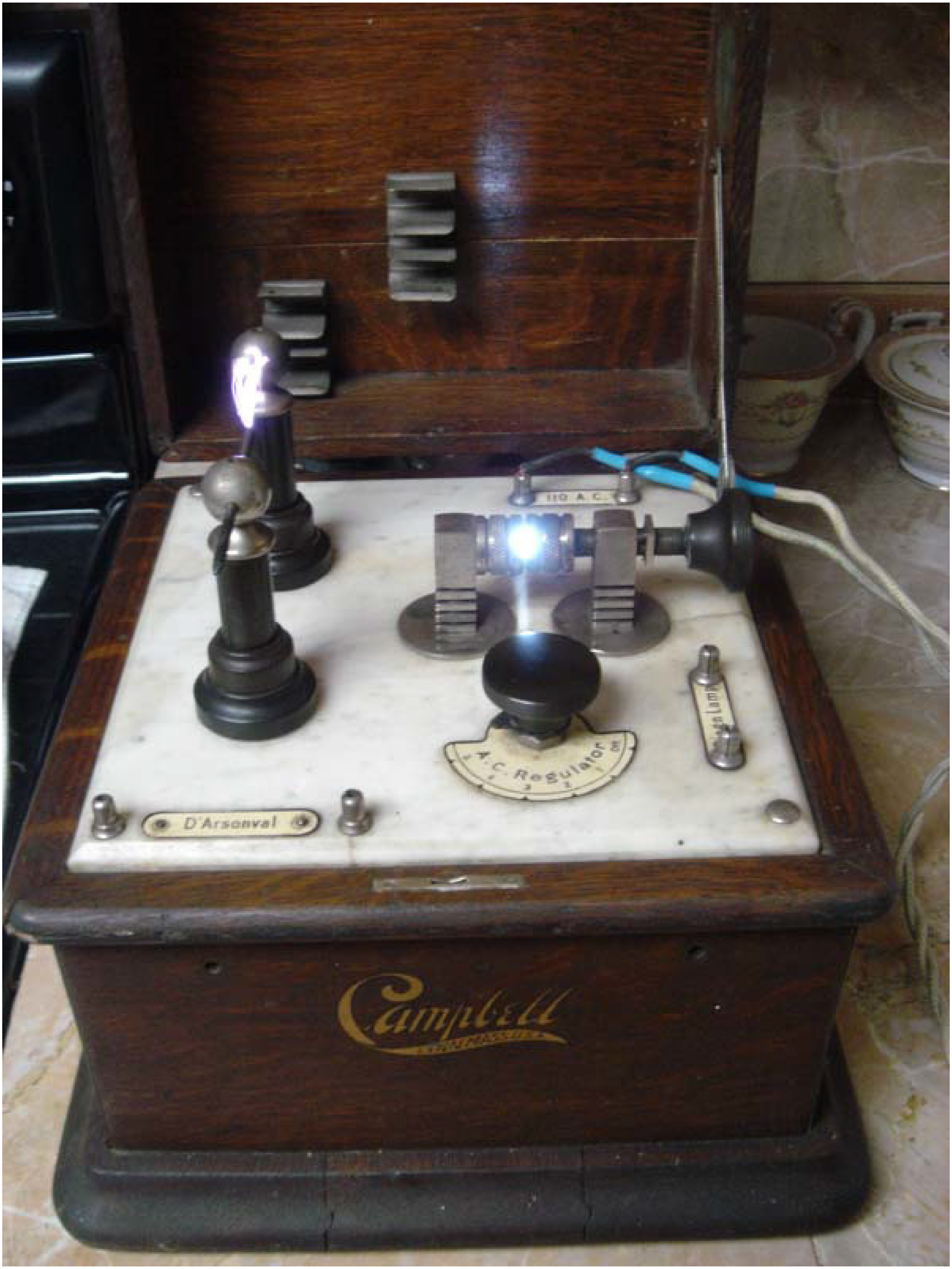


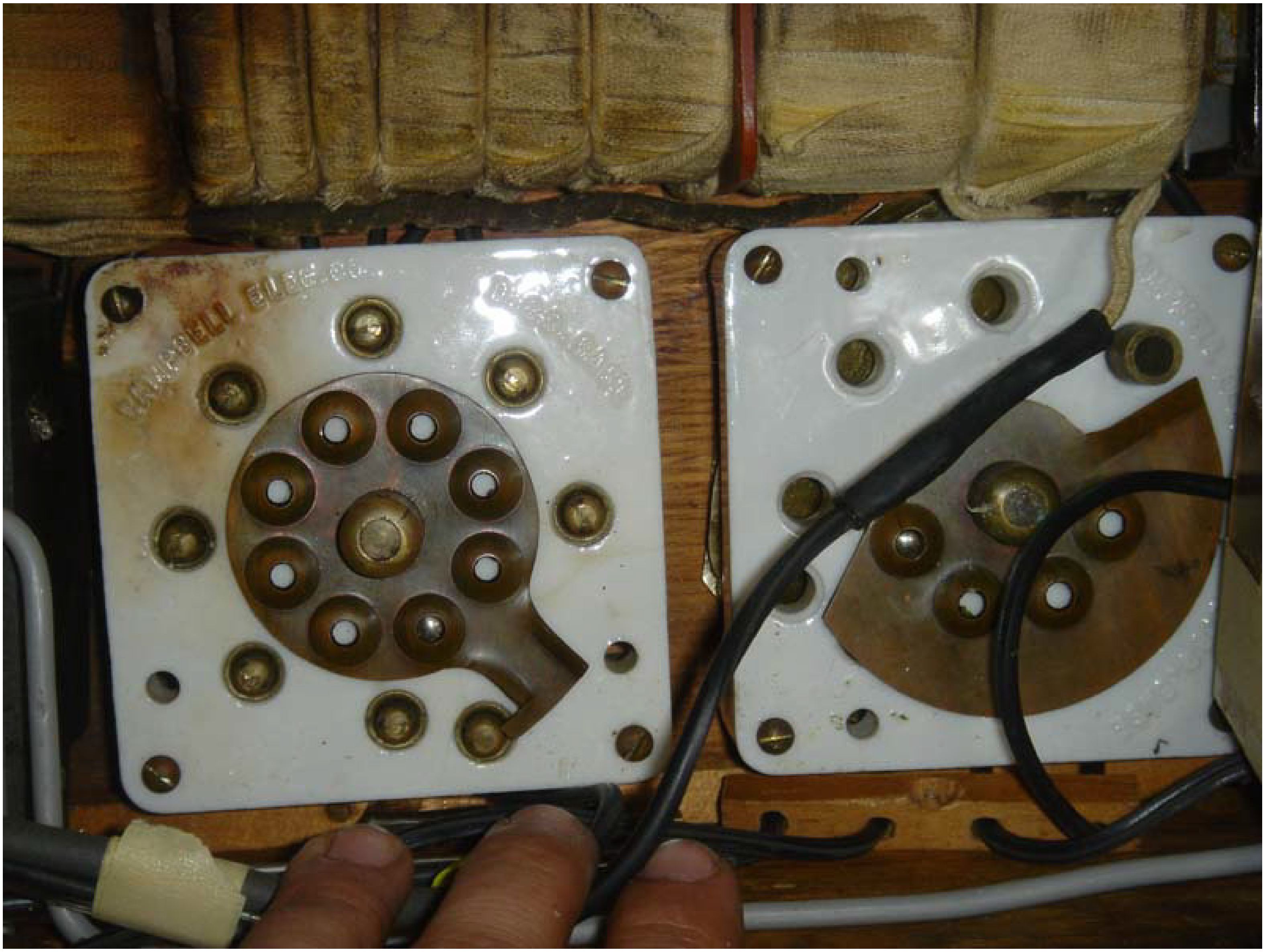


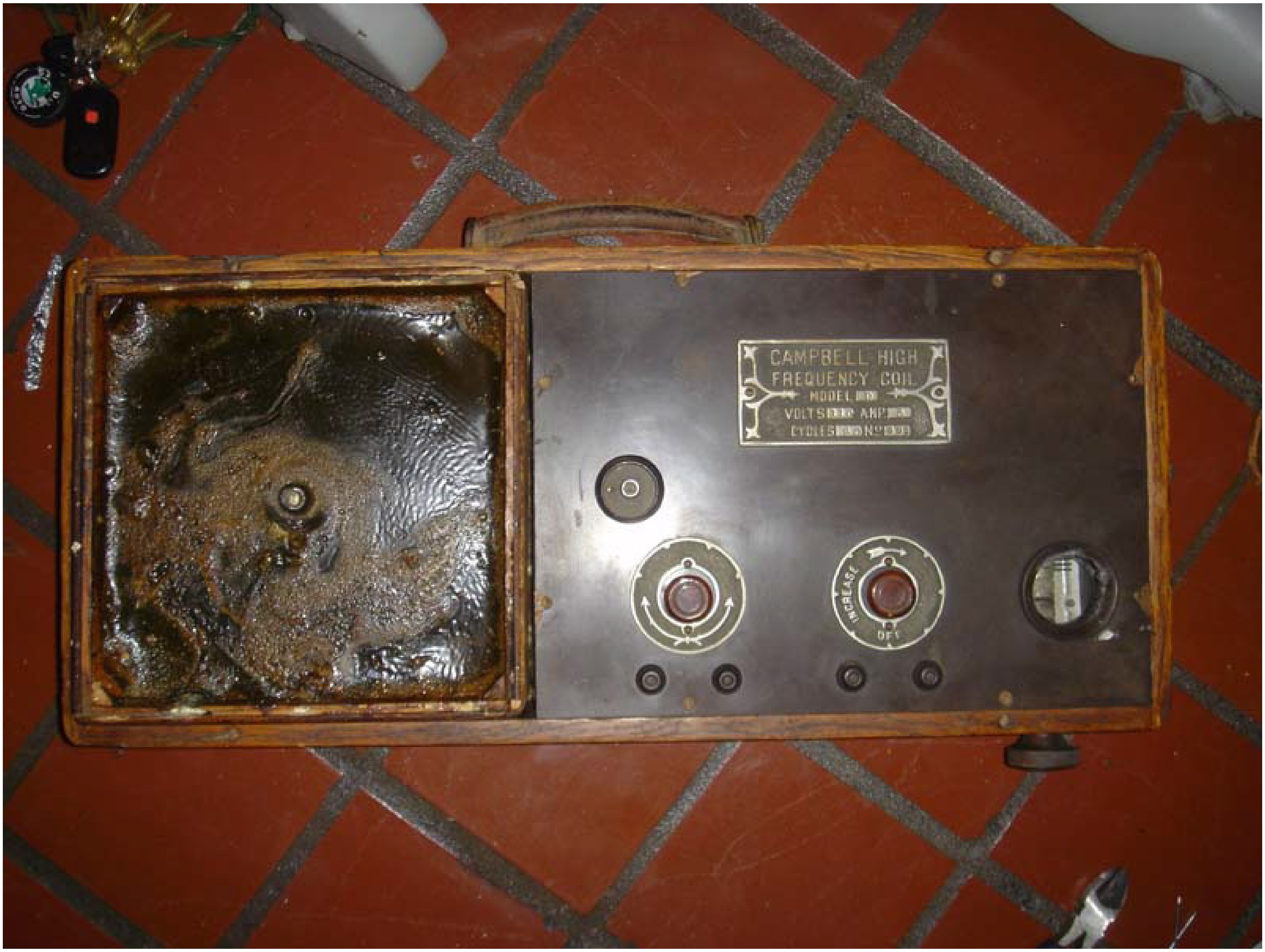

Campbell
LYNN, MASS. U.S.A.

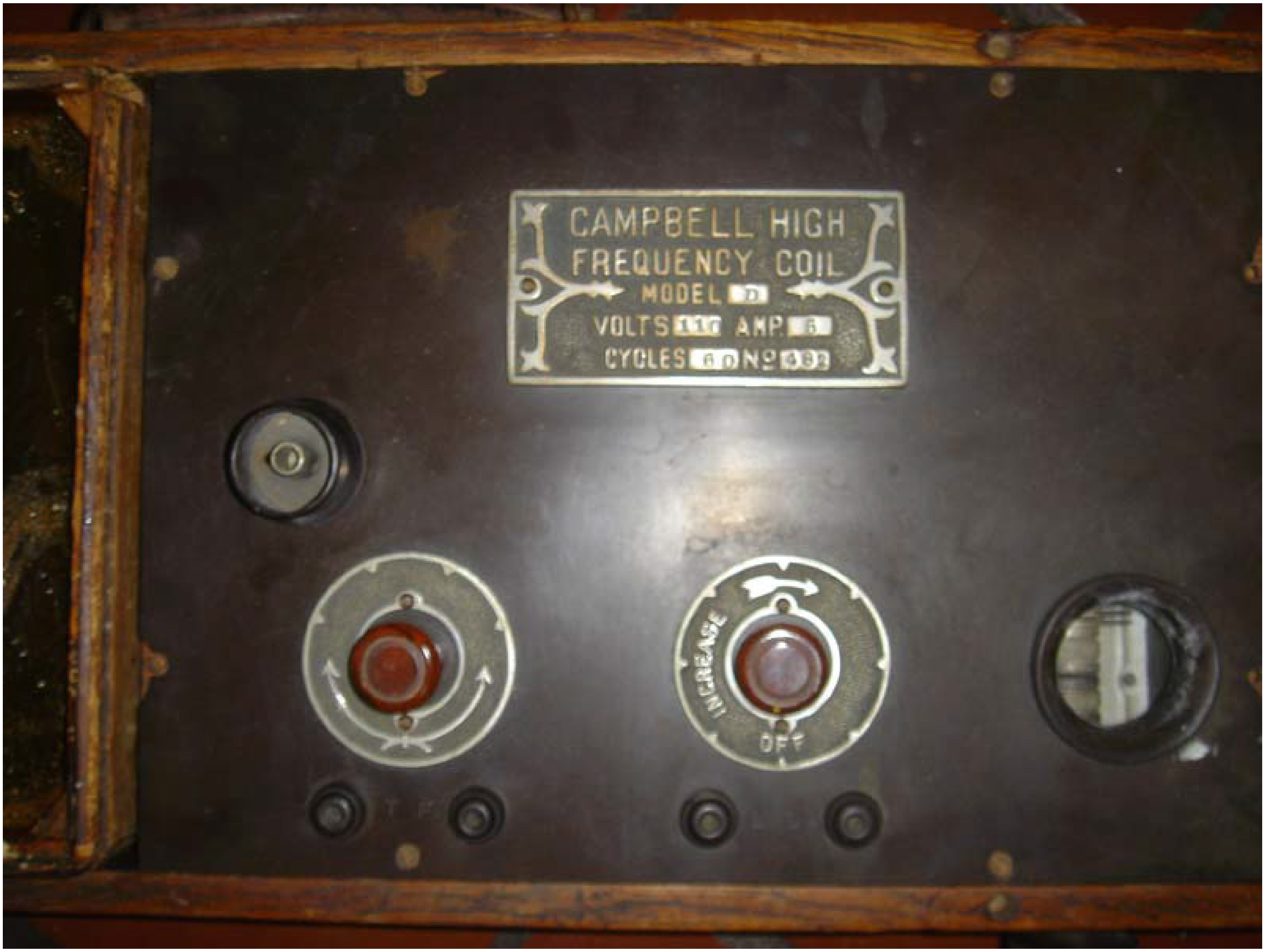

D'Arsonval
A.C. Regulator
Off
1
2
3
4
5
Lamp

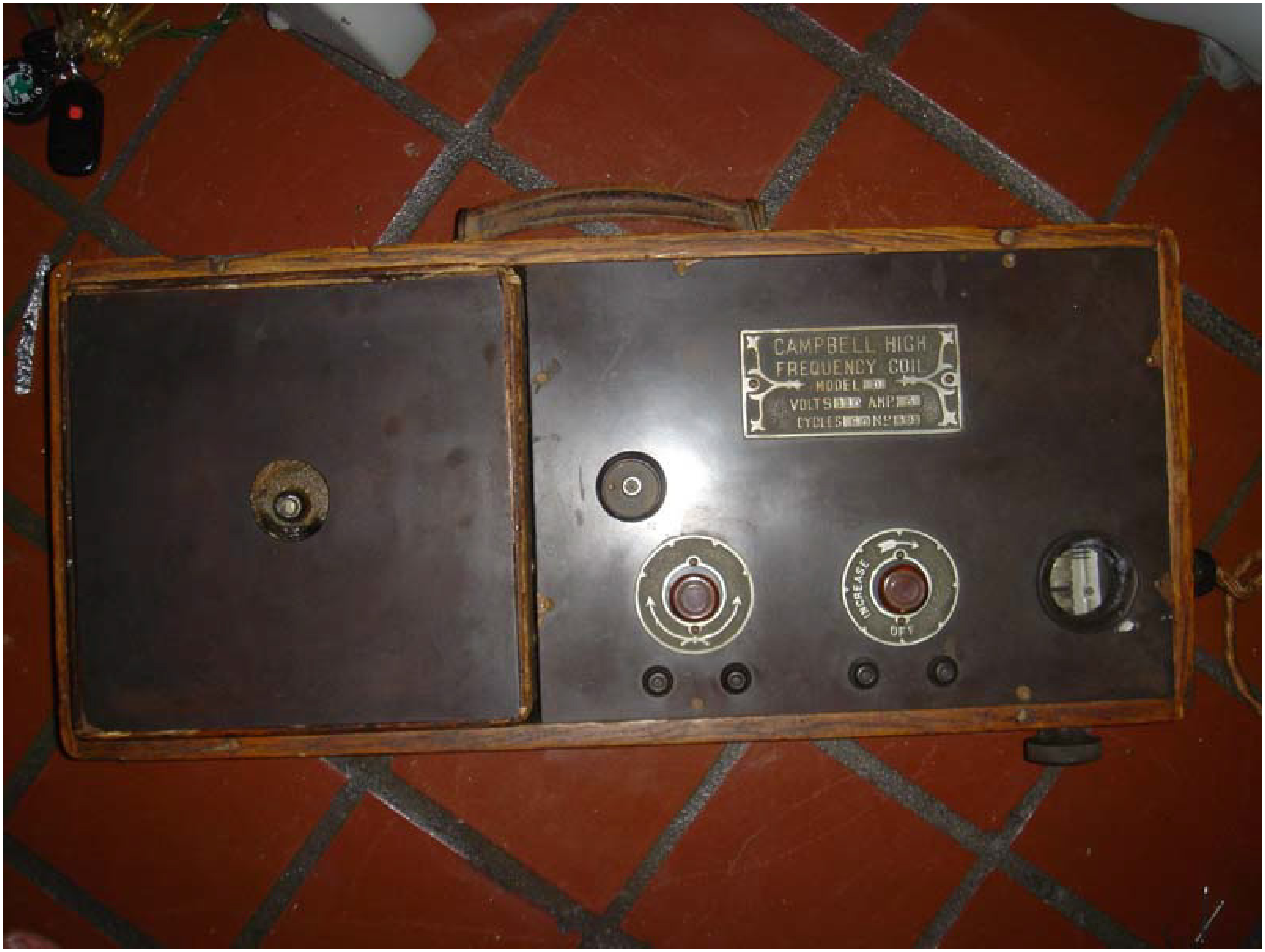

D'Arsonval
A.C. Regulator
Campbell

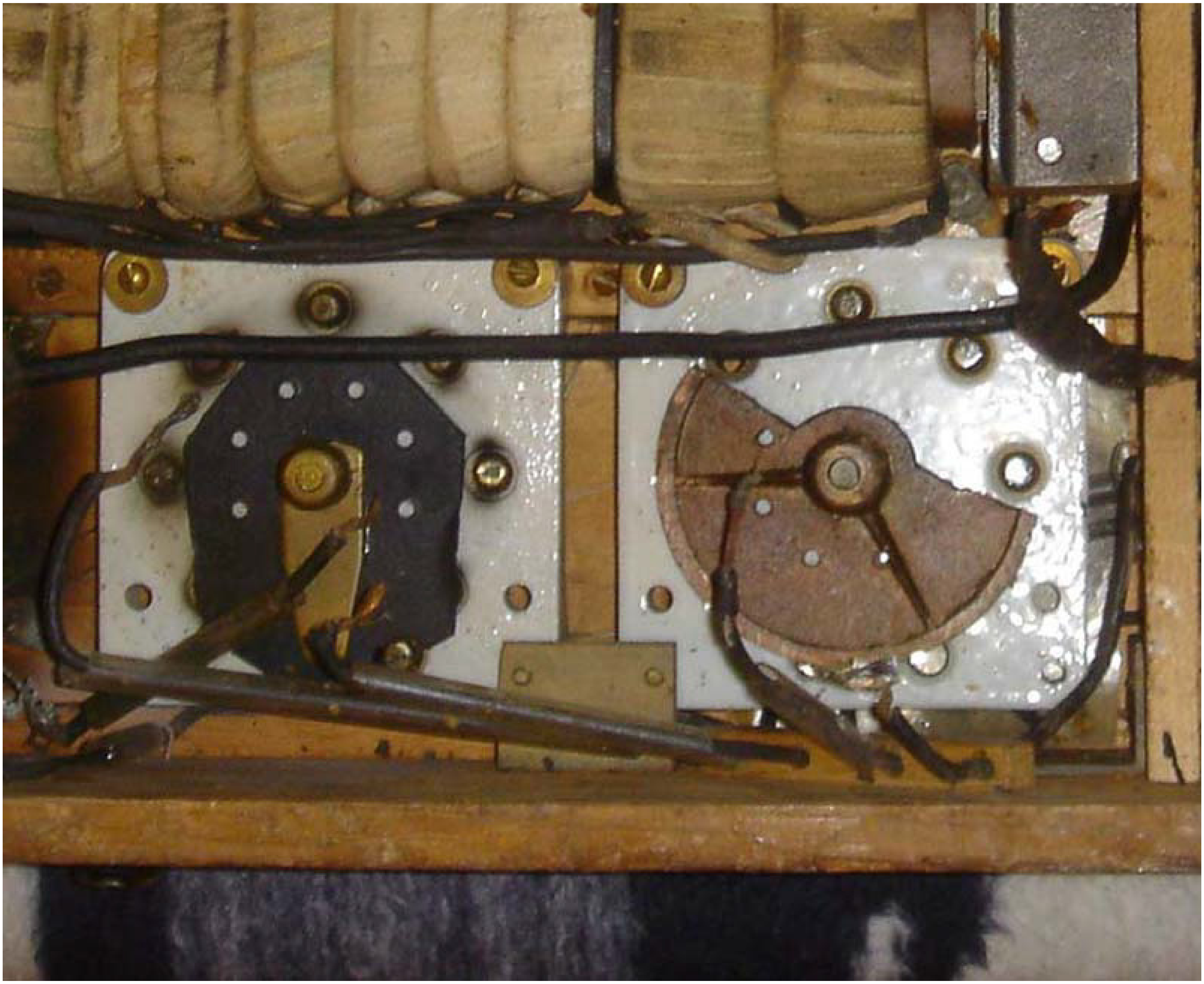

110 A.C.
D'Arsonval
A.C. Regulator
Campbell

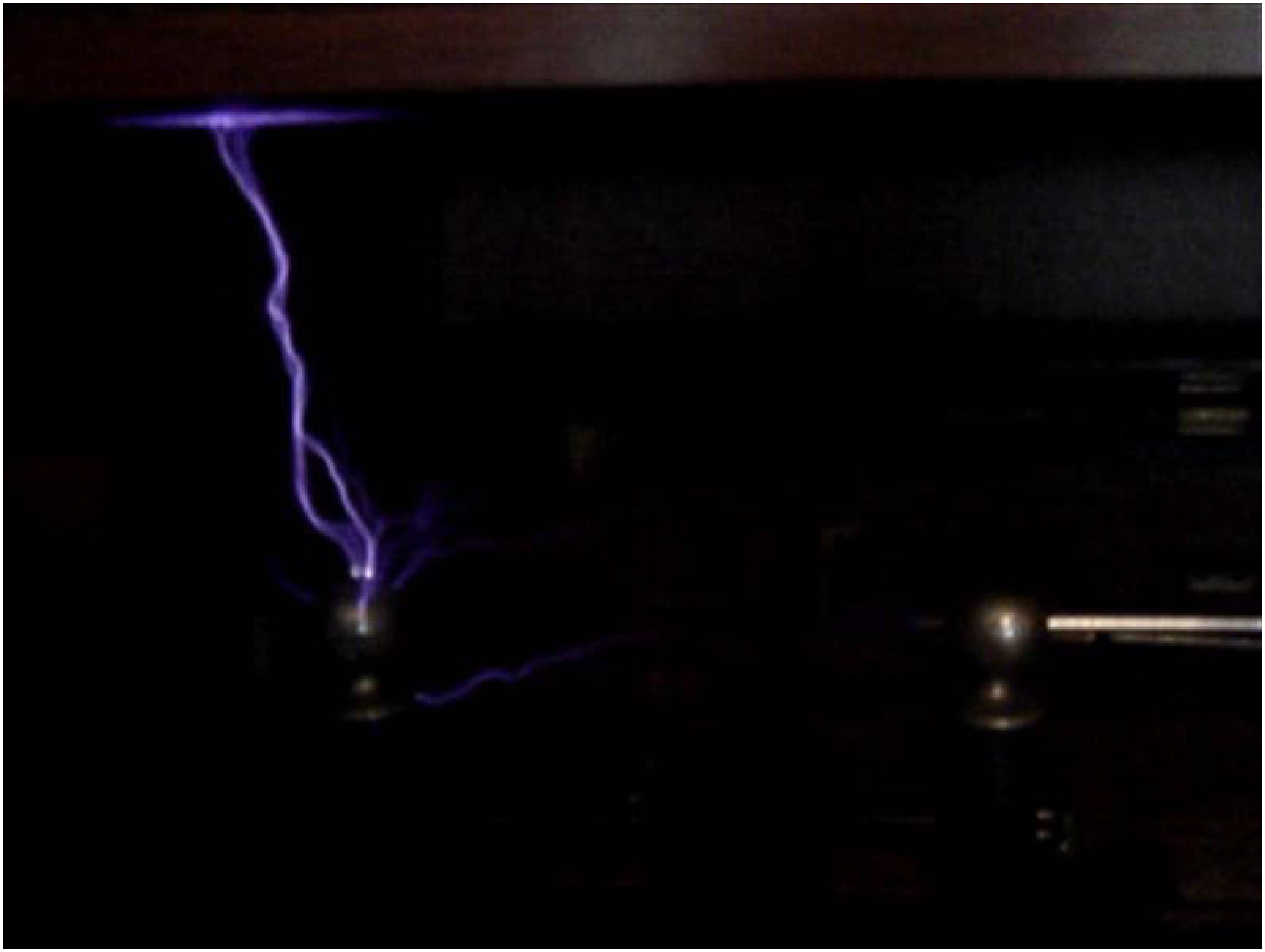

CAMPBELL ELEC. CO.

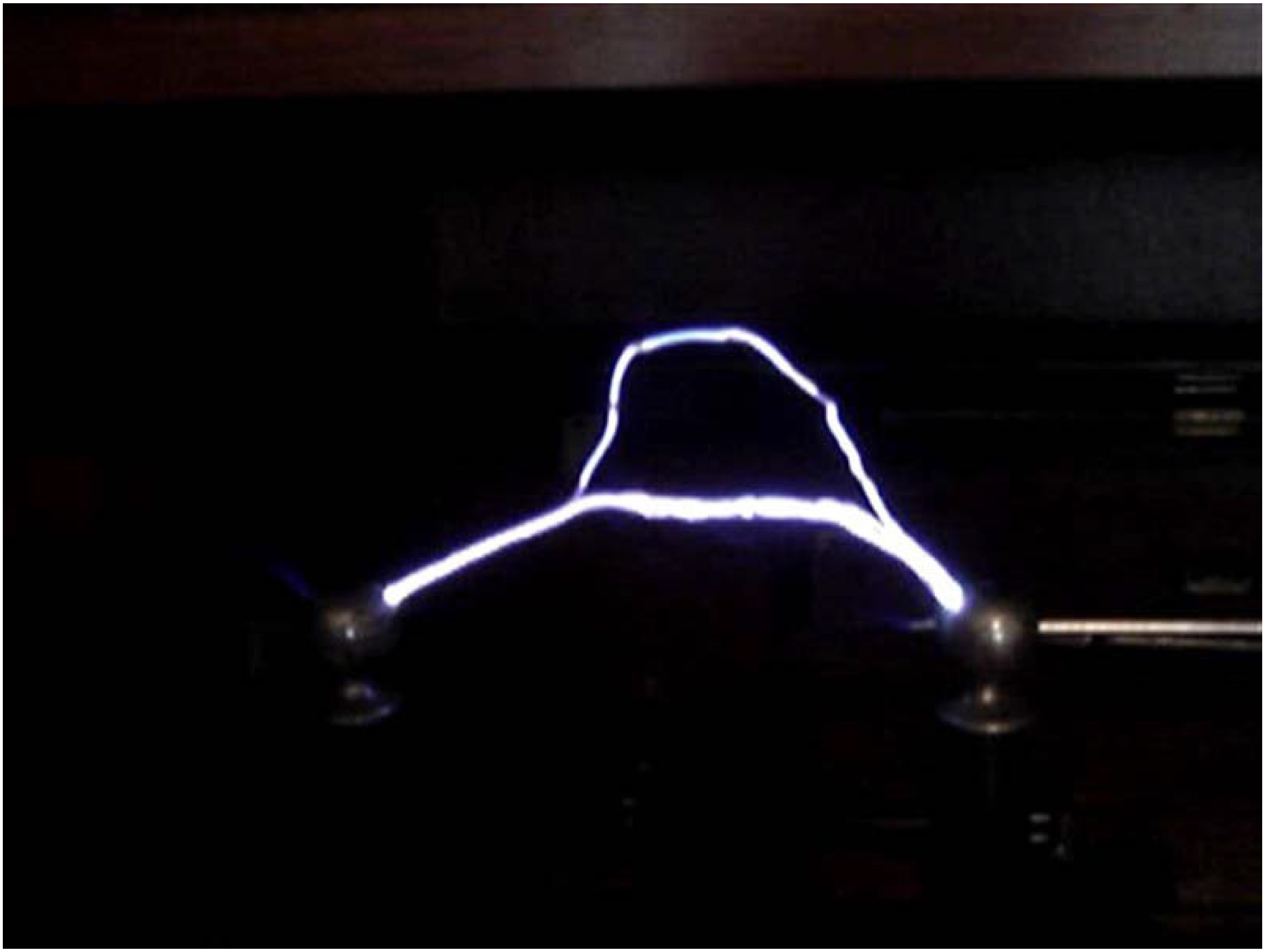

CAMPBELL HIGH
FREQUENCY COIL
MODEL
VOLTS
AMP
CYCLES
No
INCREASE
OFF

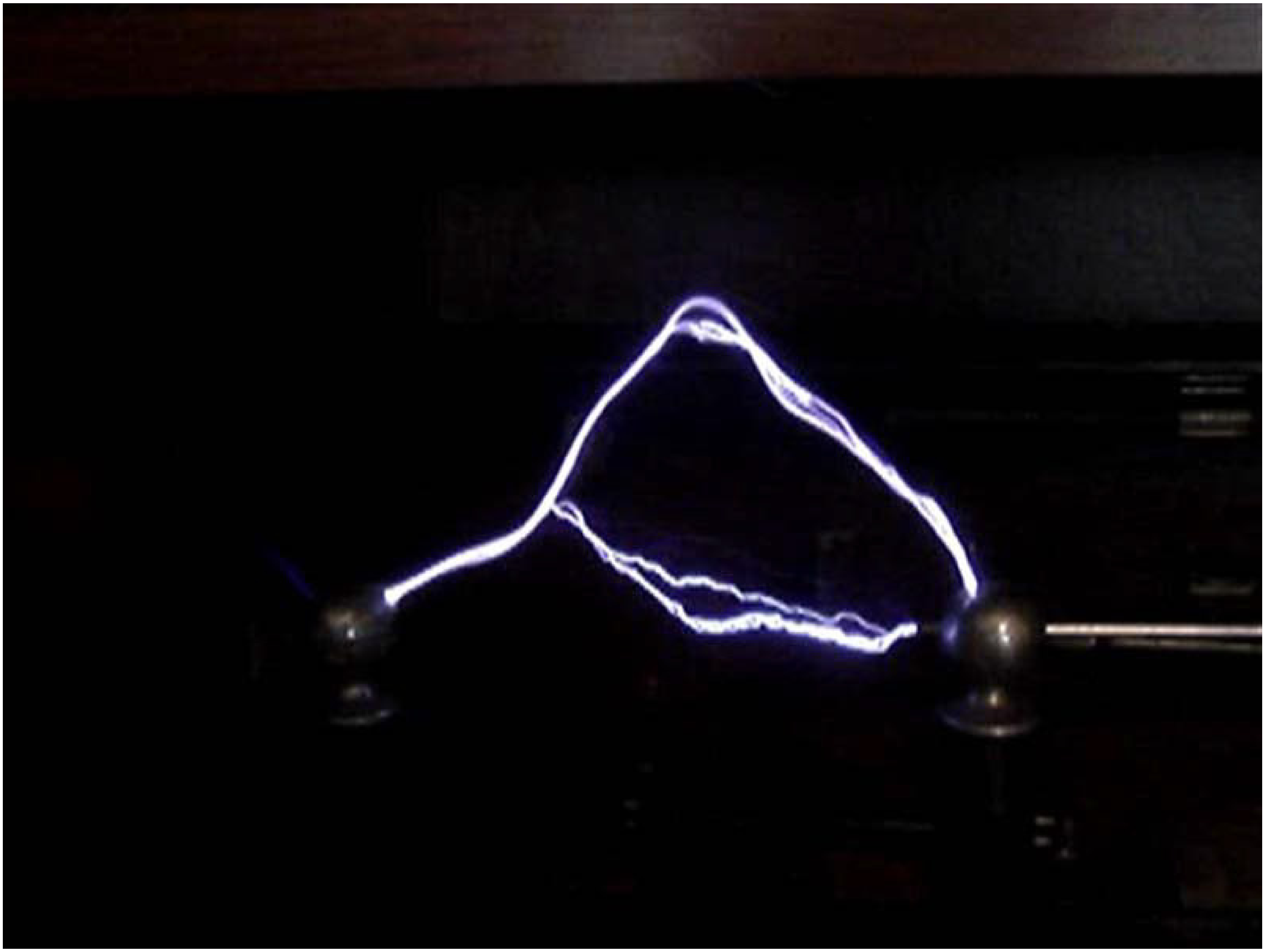

CAMPBELL HIGH
FREQUENCY COIL
MODEL D
VOLTS 110 AMP. 6
CYCLES 60 No 482
INCREASE
OFF

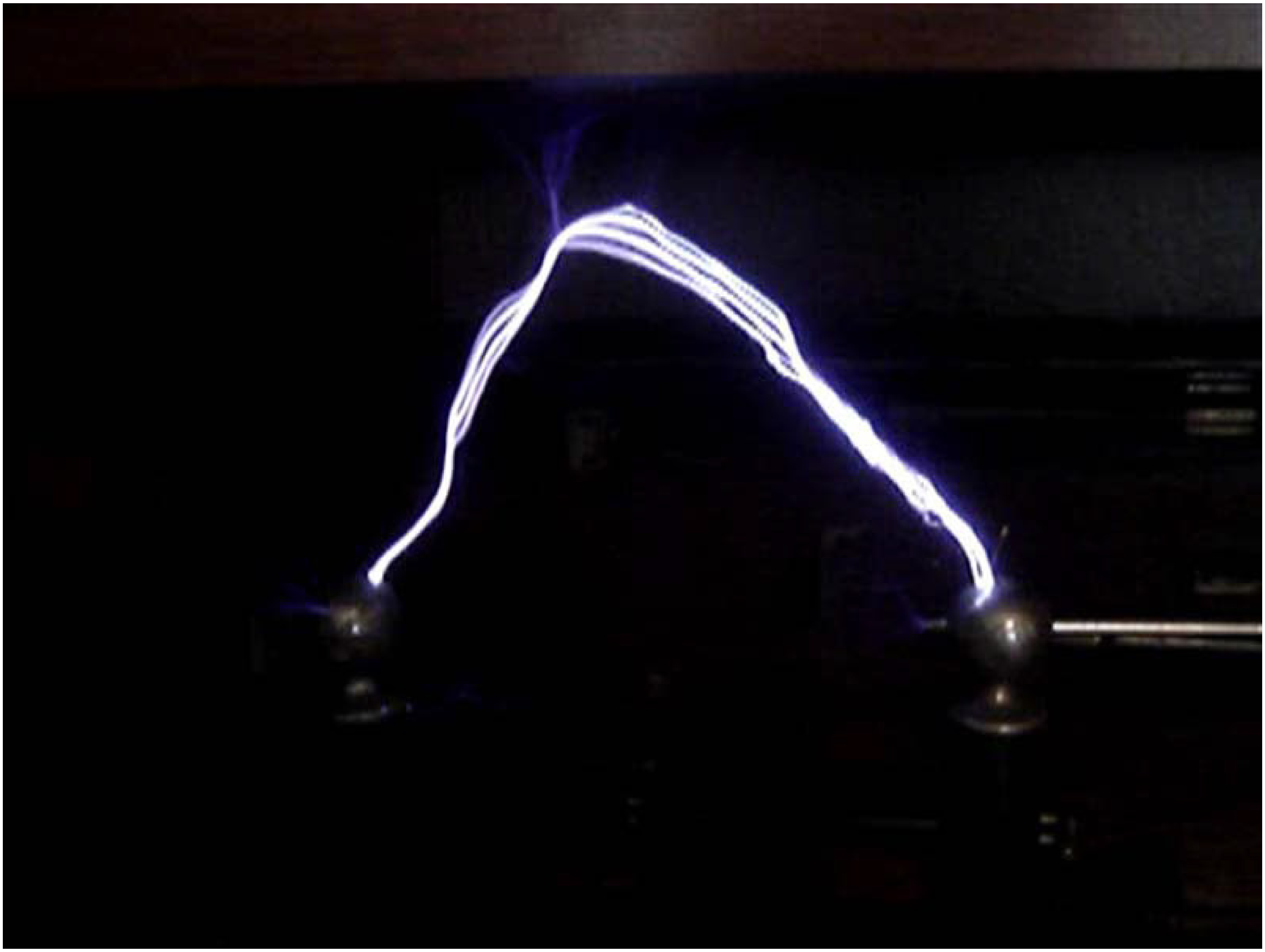

CAMPBELL HIGH
FREQUENCY COIL
MODEL
VOLTS
AMP
CYCLES
No
INCREASE
OFF

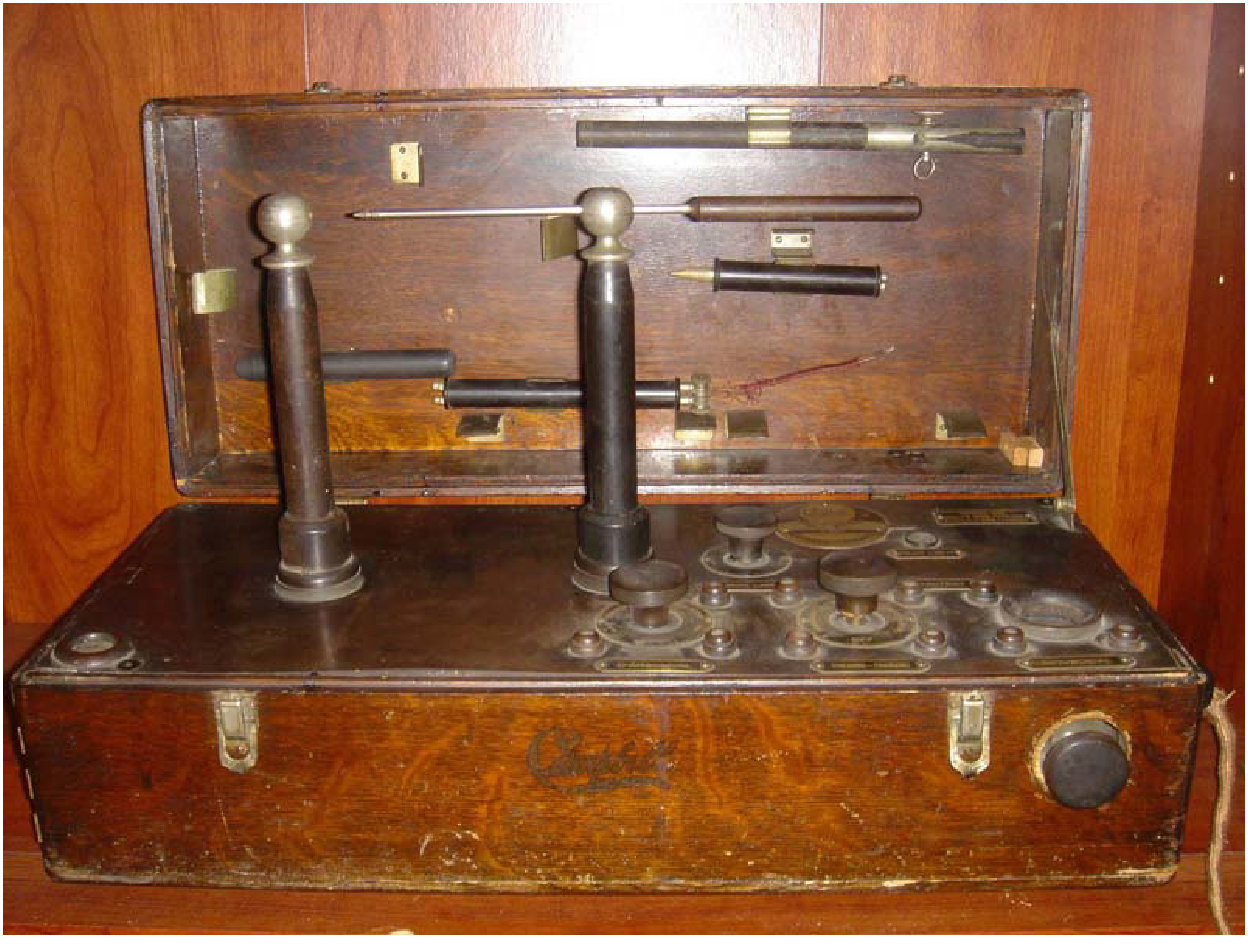


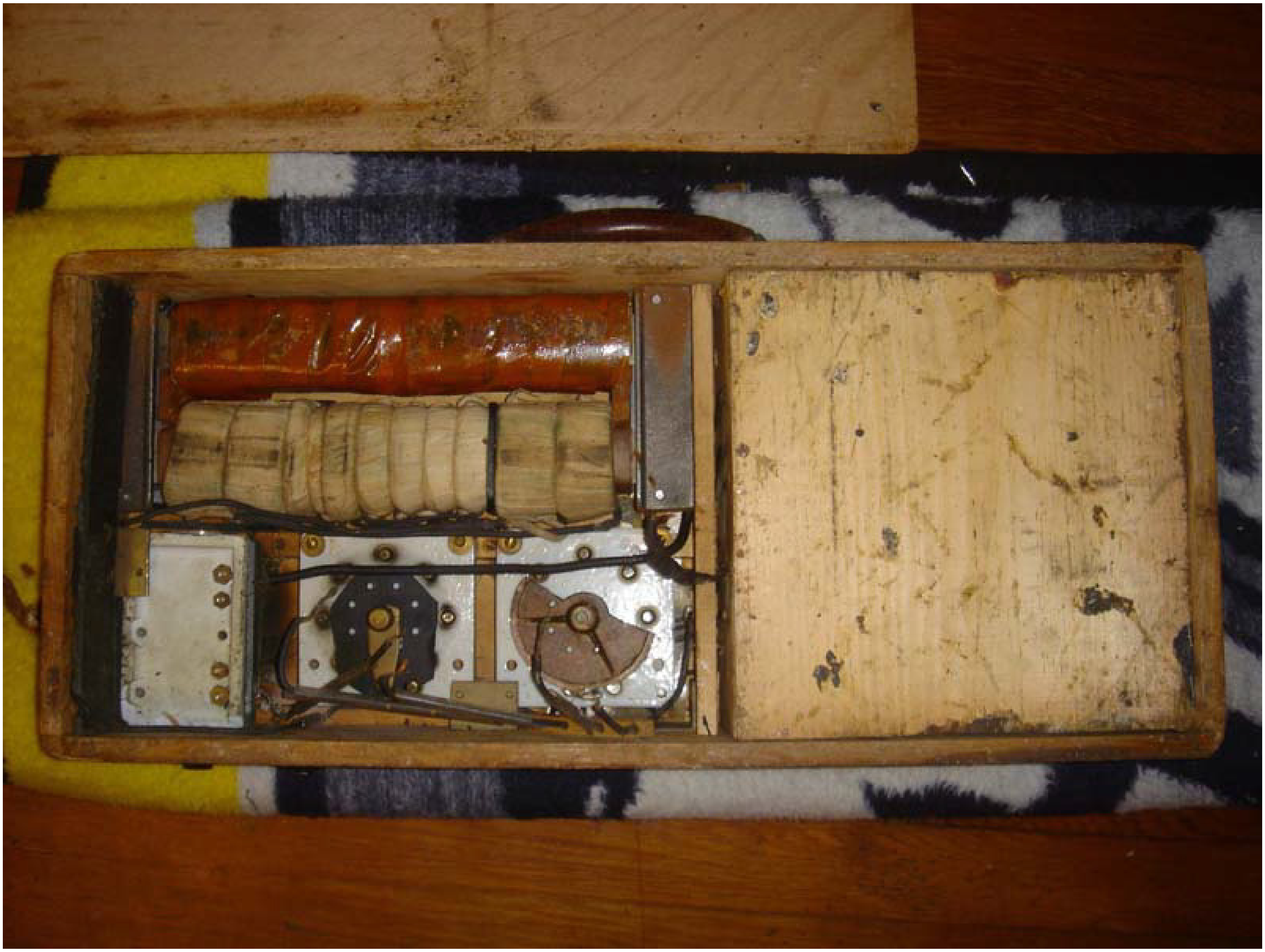


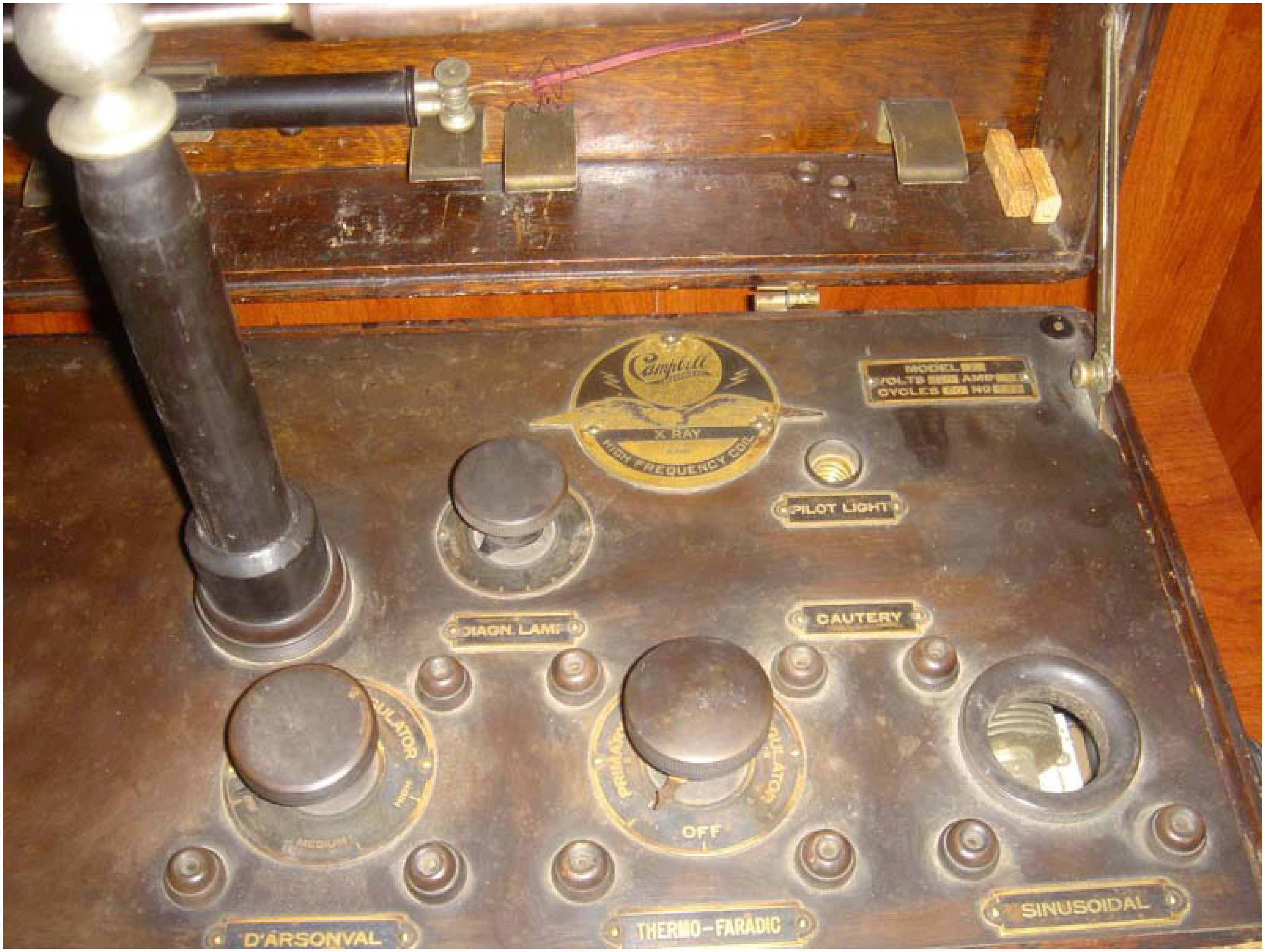


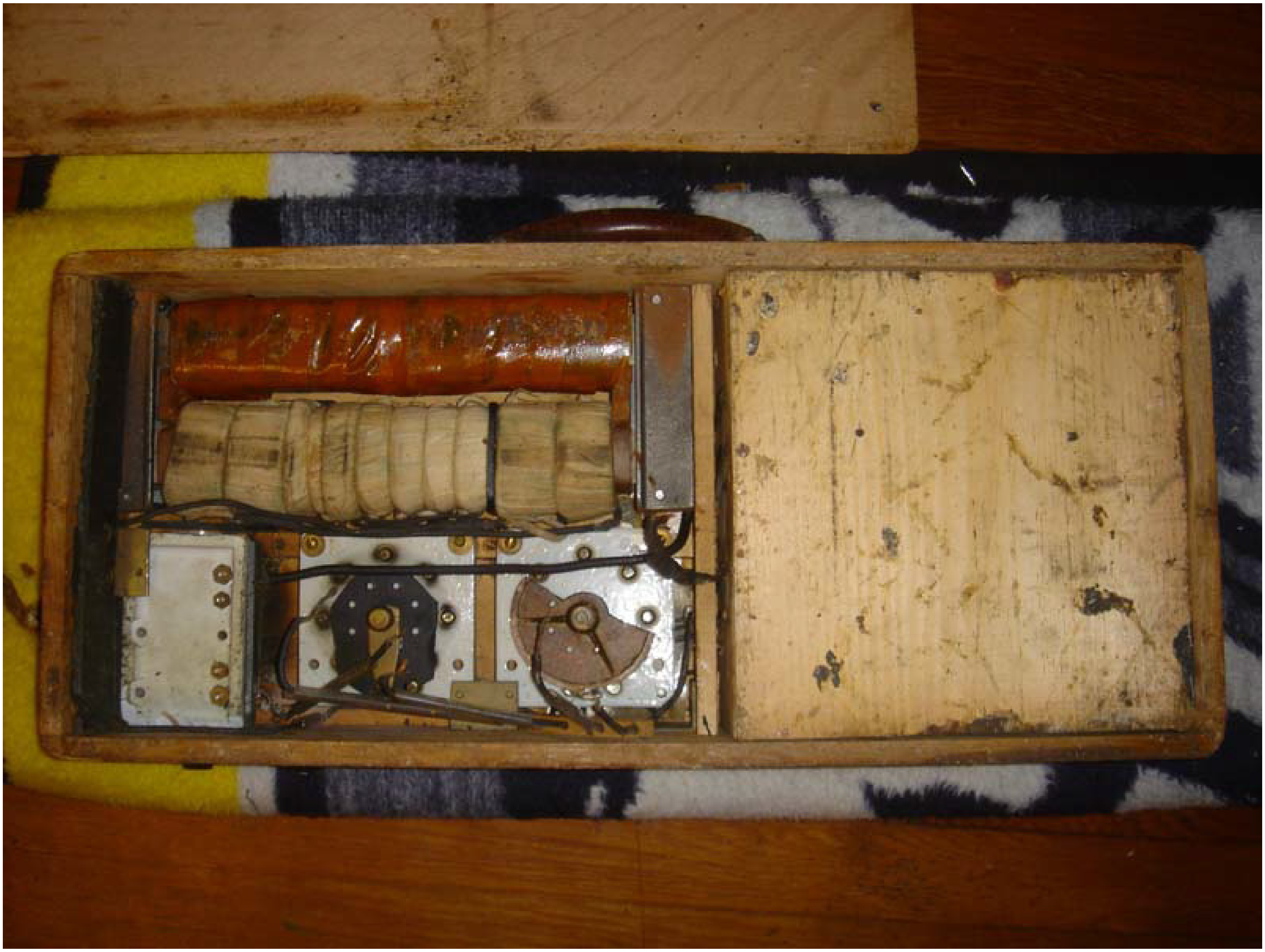


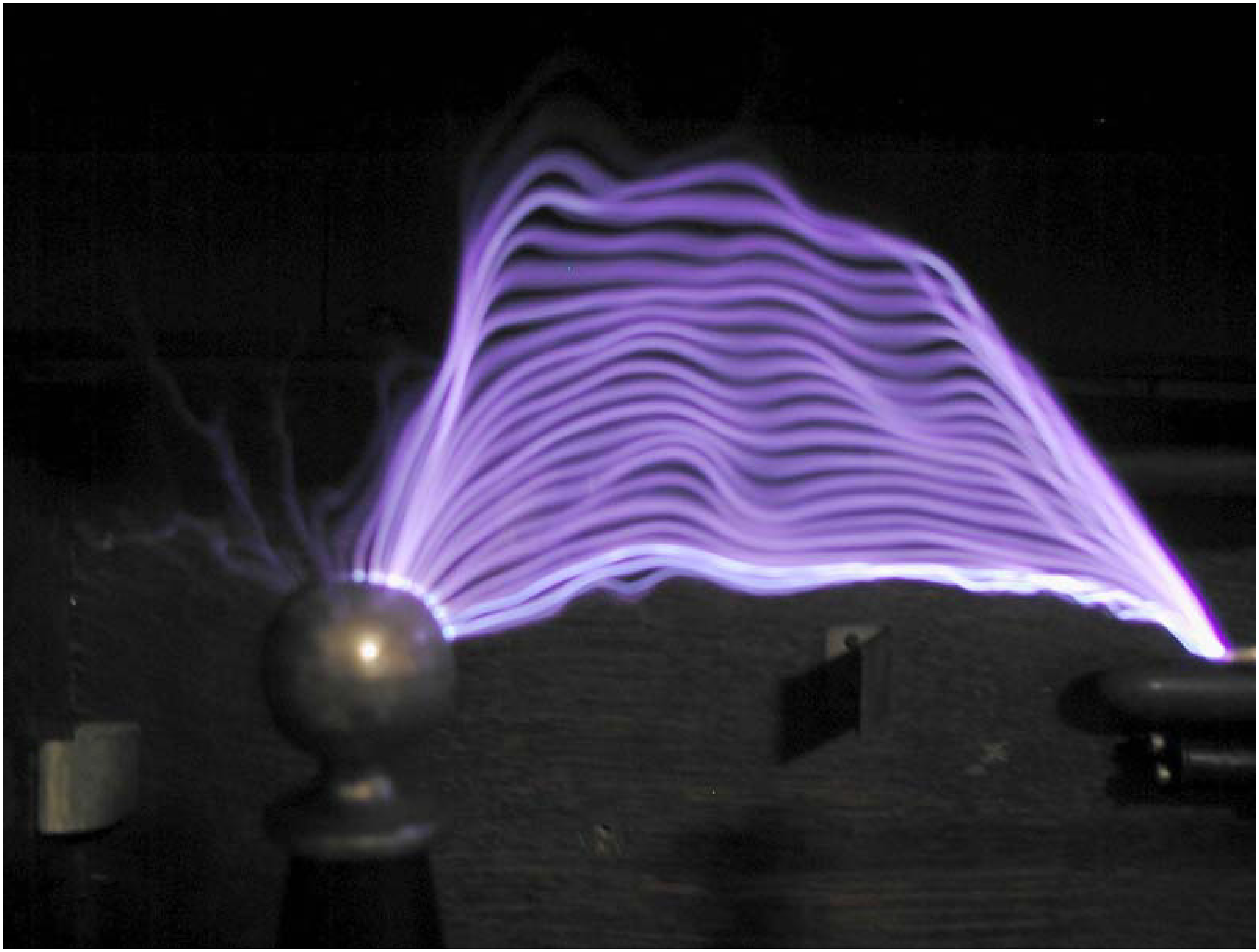


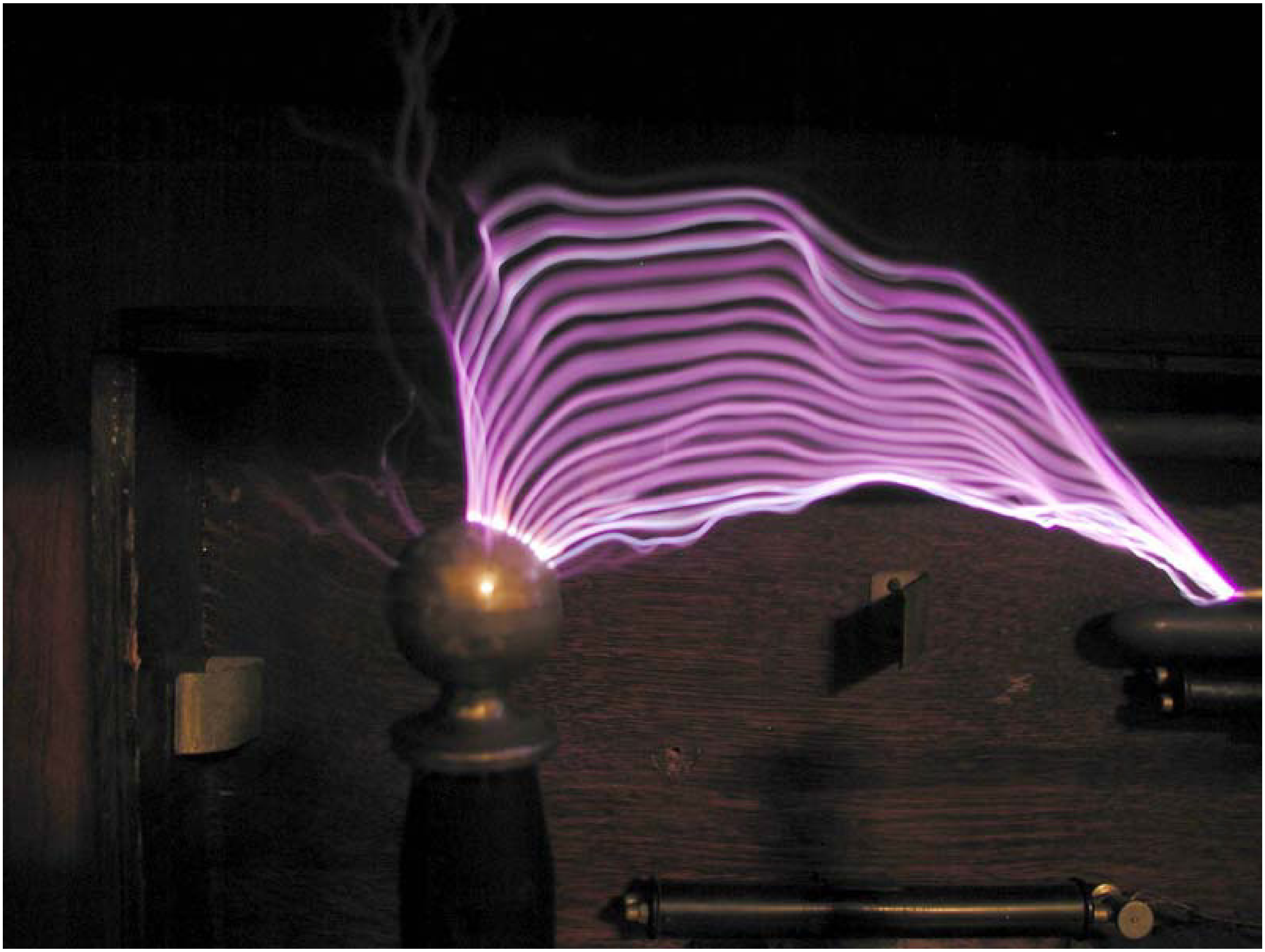


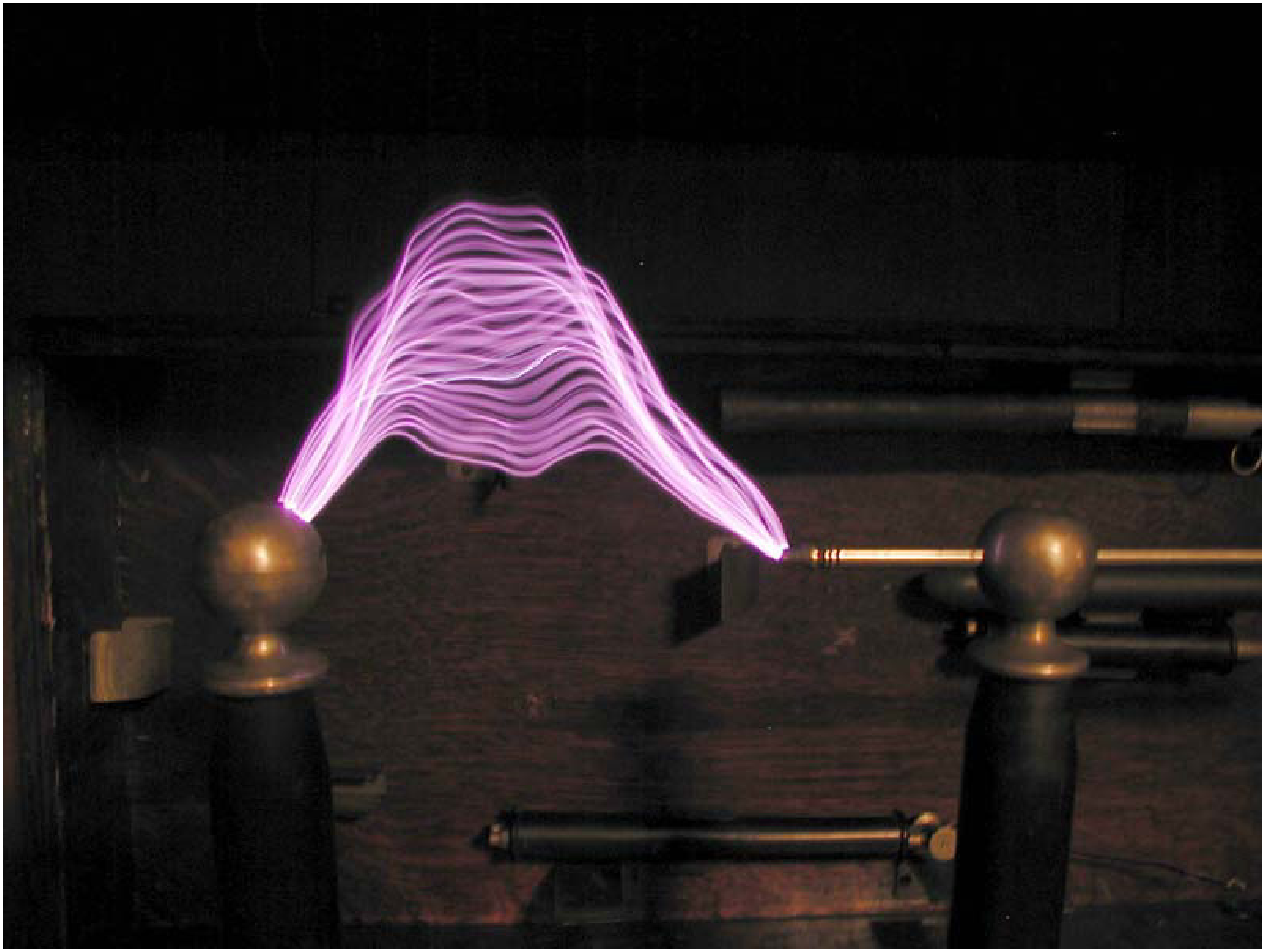


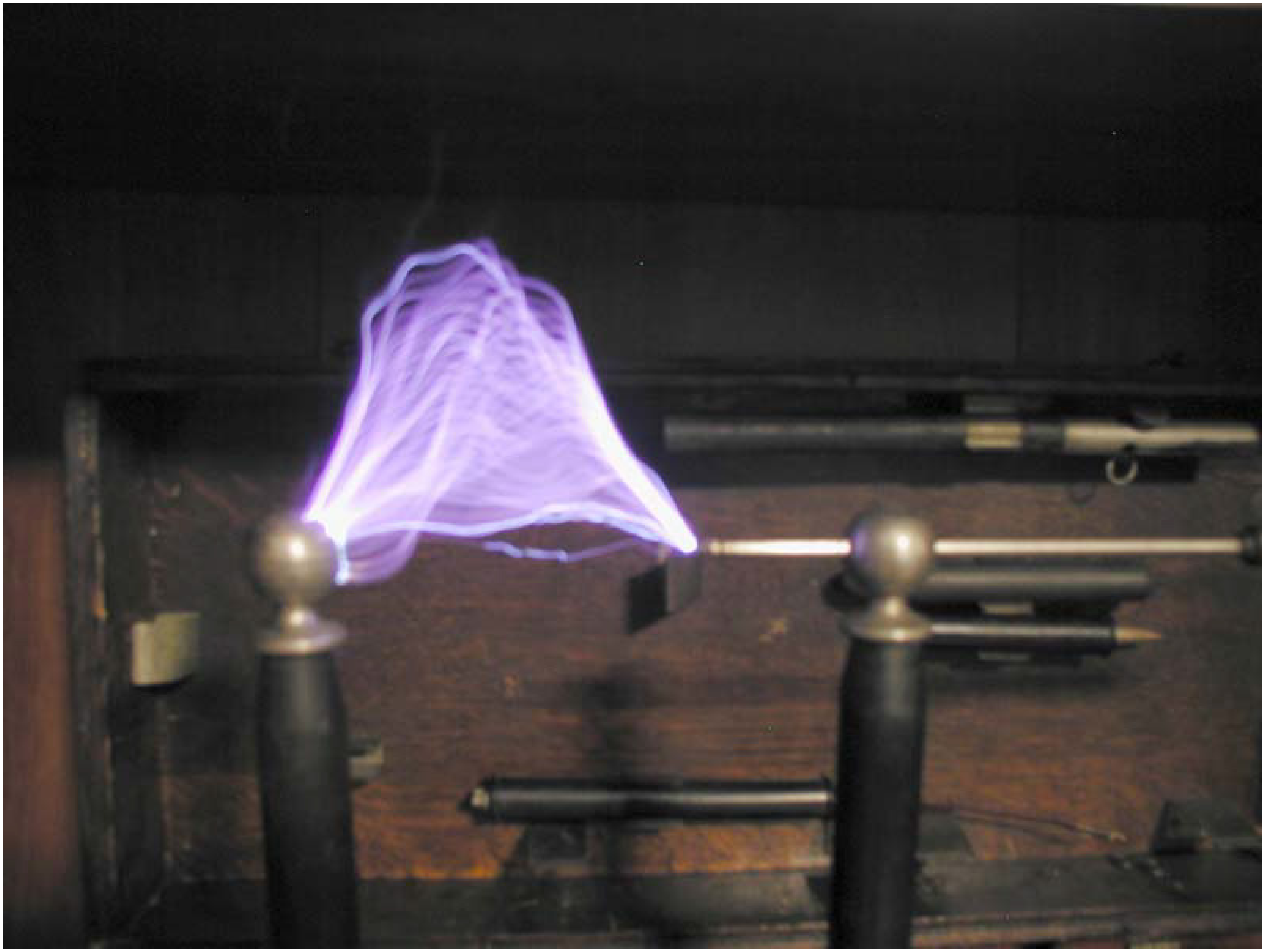

Campbell
X RAY
HIGH FREQUENCY COIL
MODEL
VOLTS
AMP
CYCLES
NO
PILOT LIGHT
DIAGN. LAMP
CAUTERY
ULATOR
MEDIUM
HIGH
PRIMA
ULATOR
OFF
D'ARSONVAL
THERMO-FARADIC
SINUSOIDAL

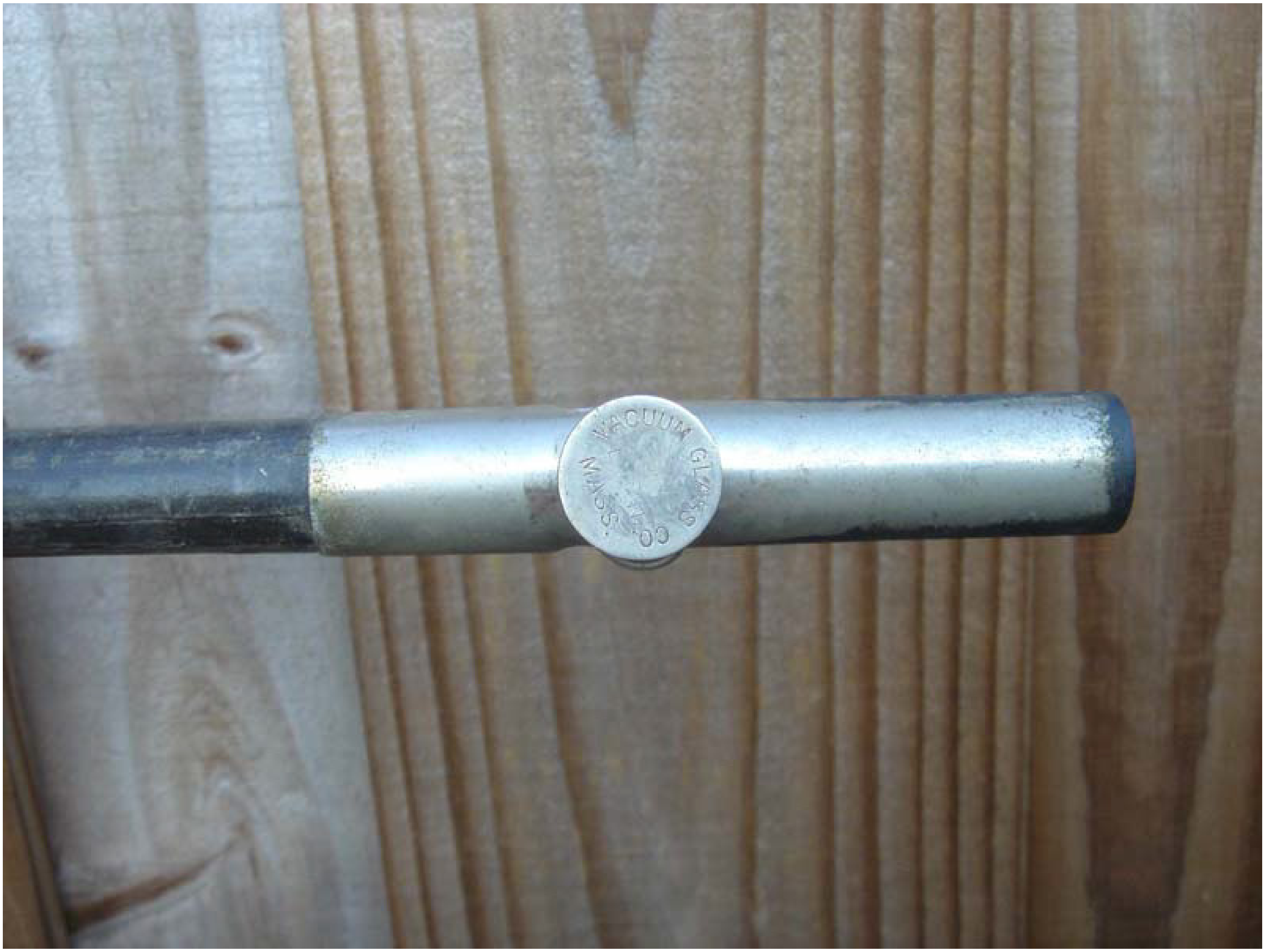




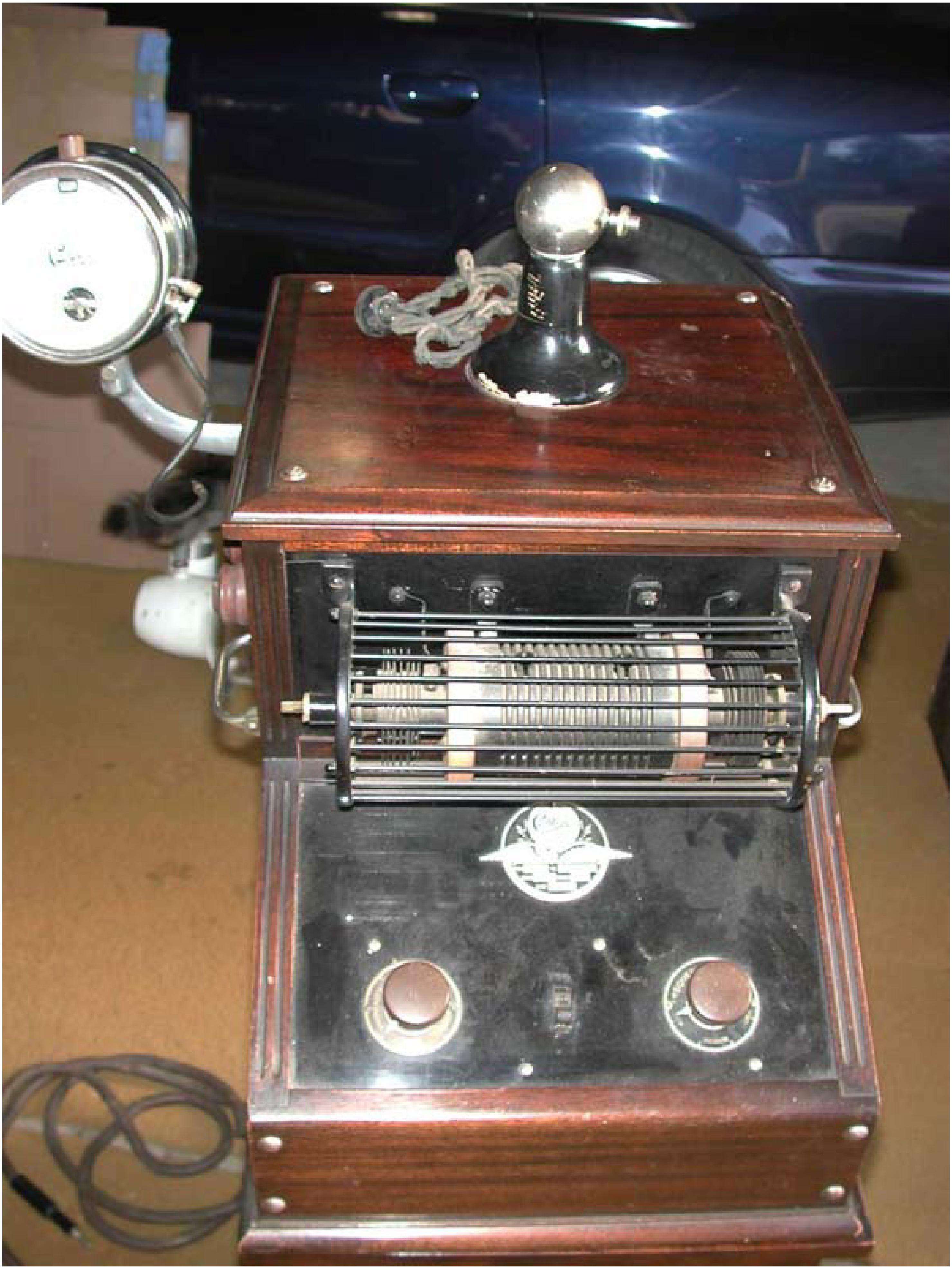


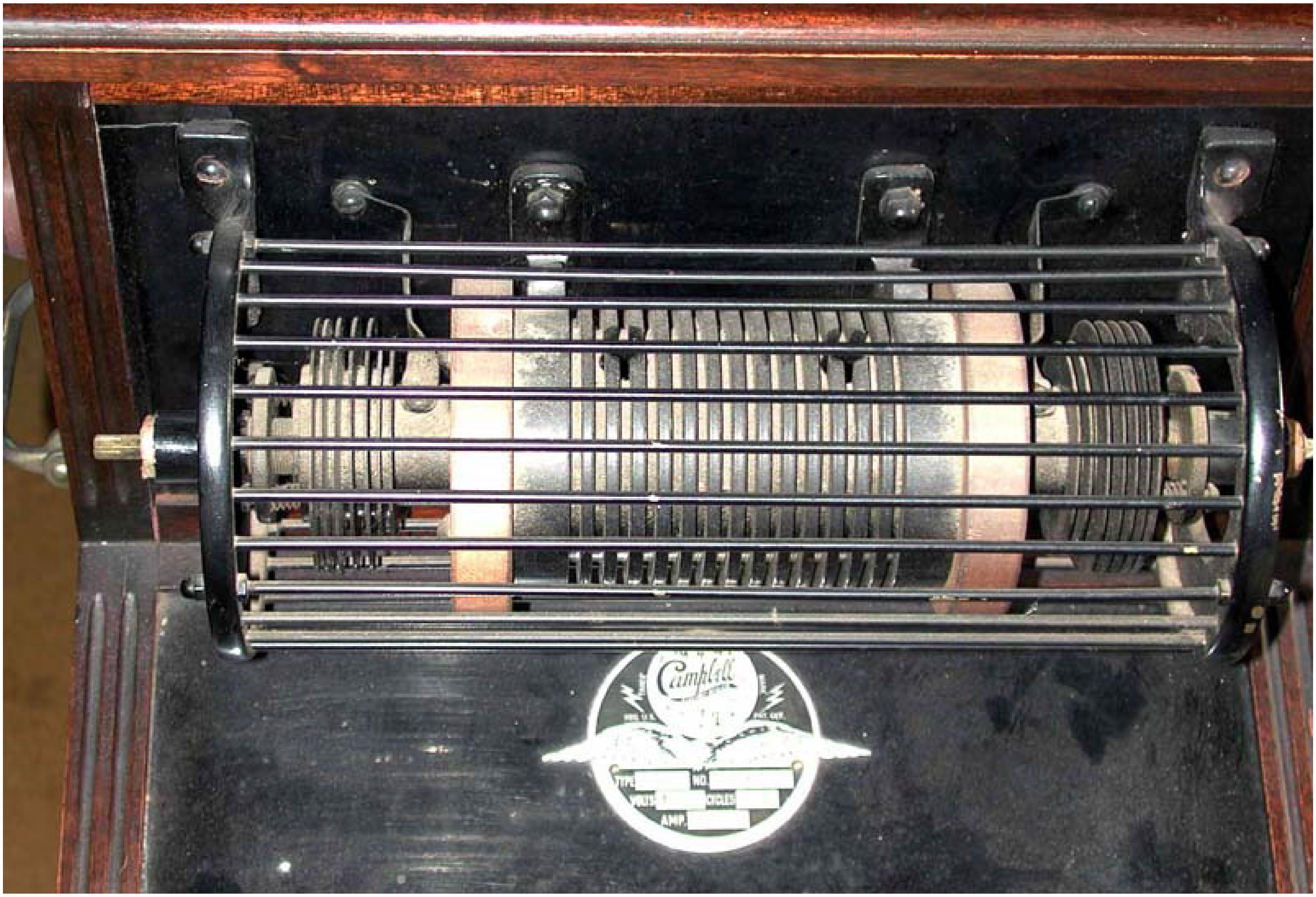


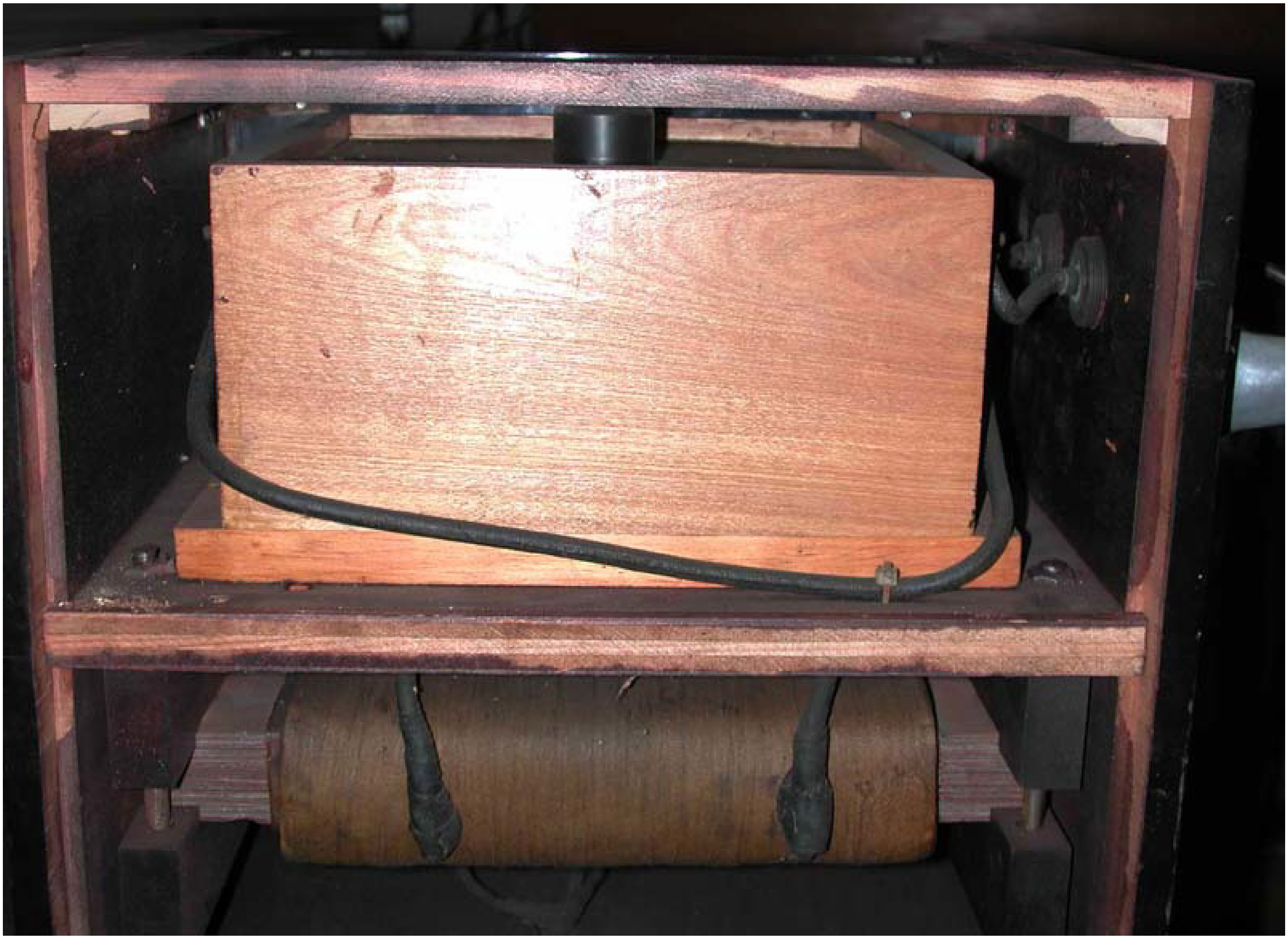


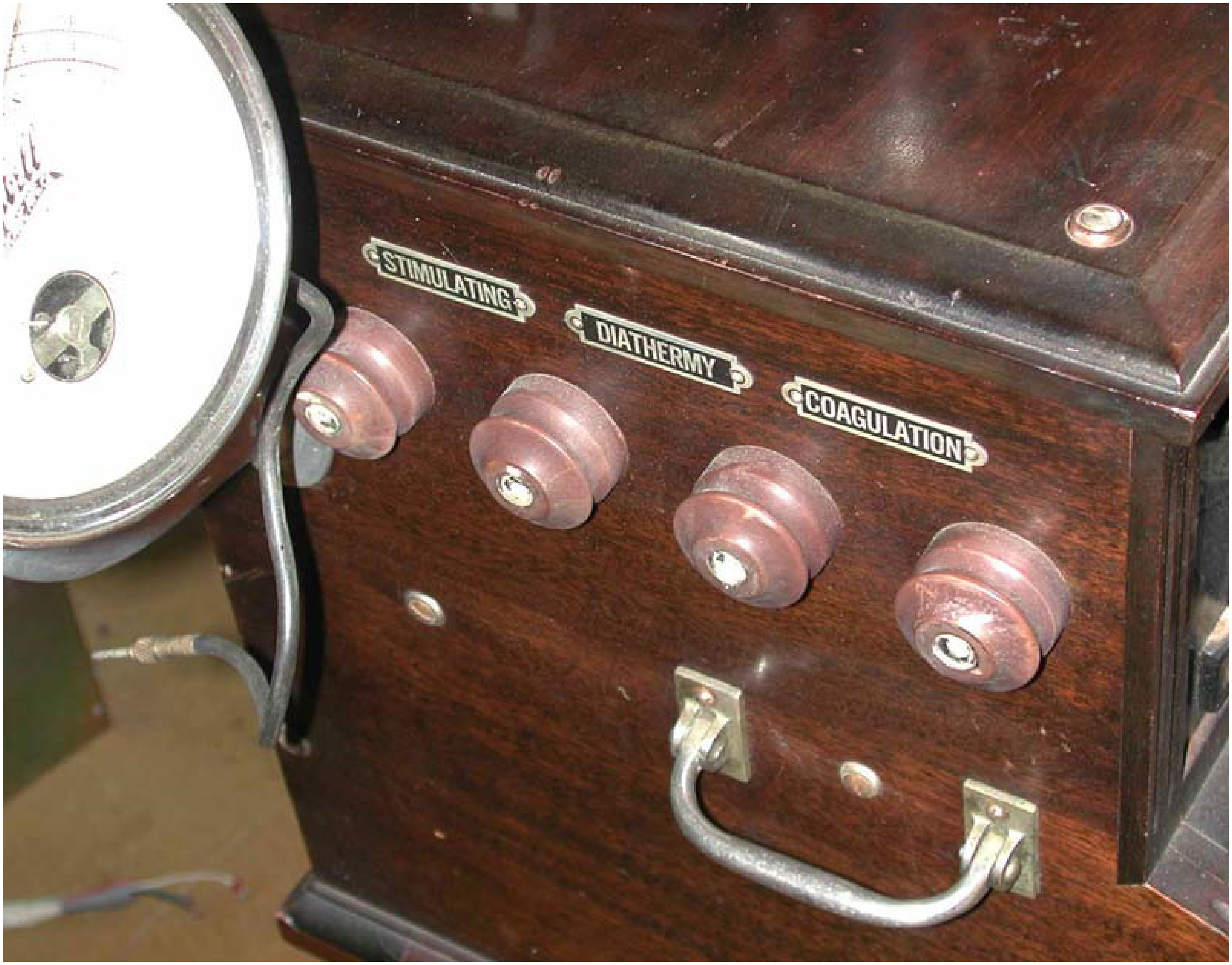

VACUUM GLASS CO
MASS.

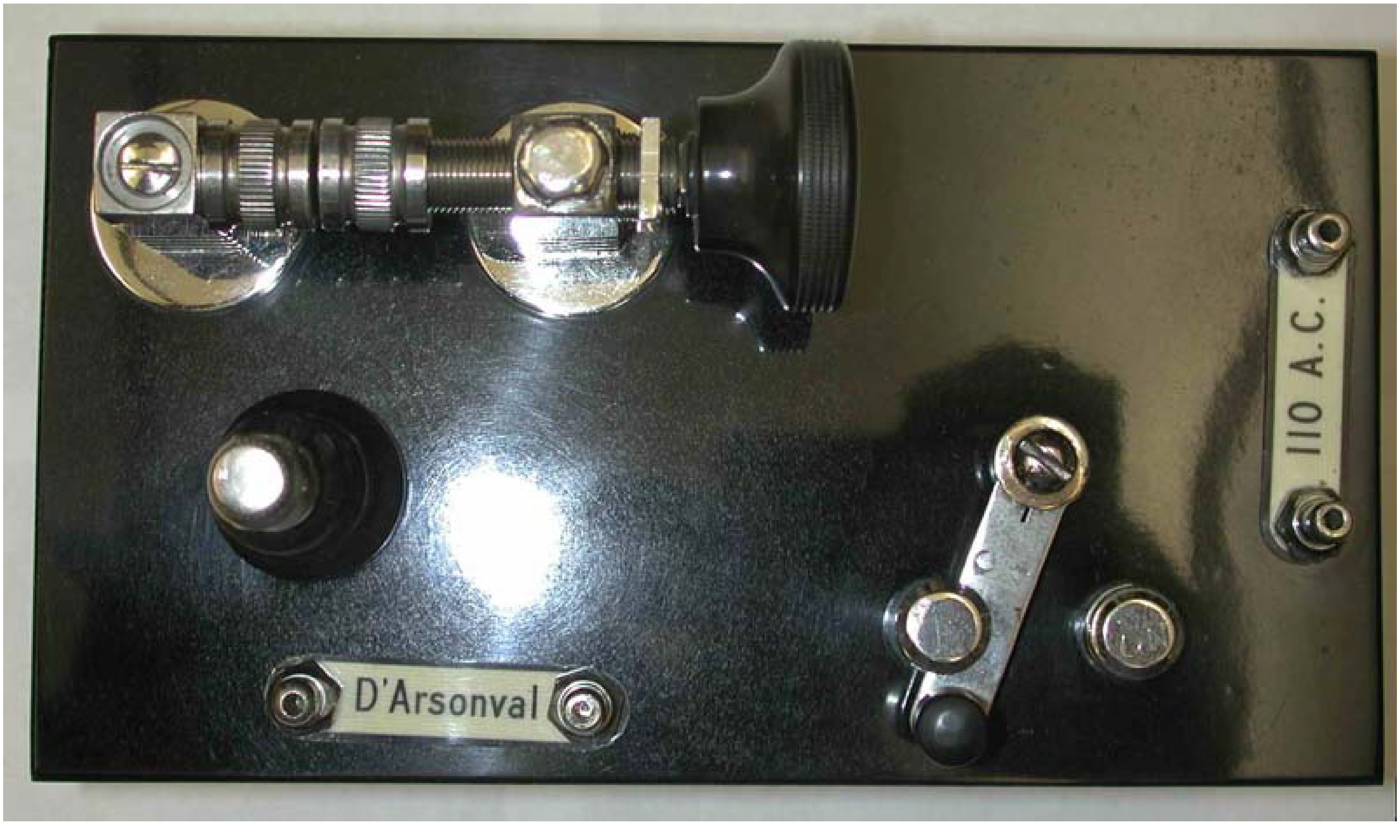
CAMPBELL'S HIGH
FREQUENCY COIL

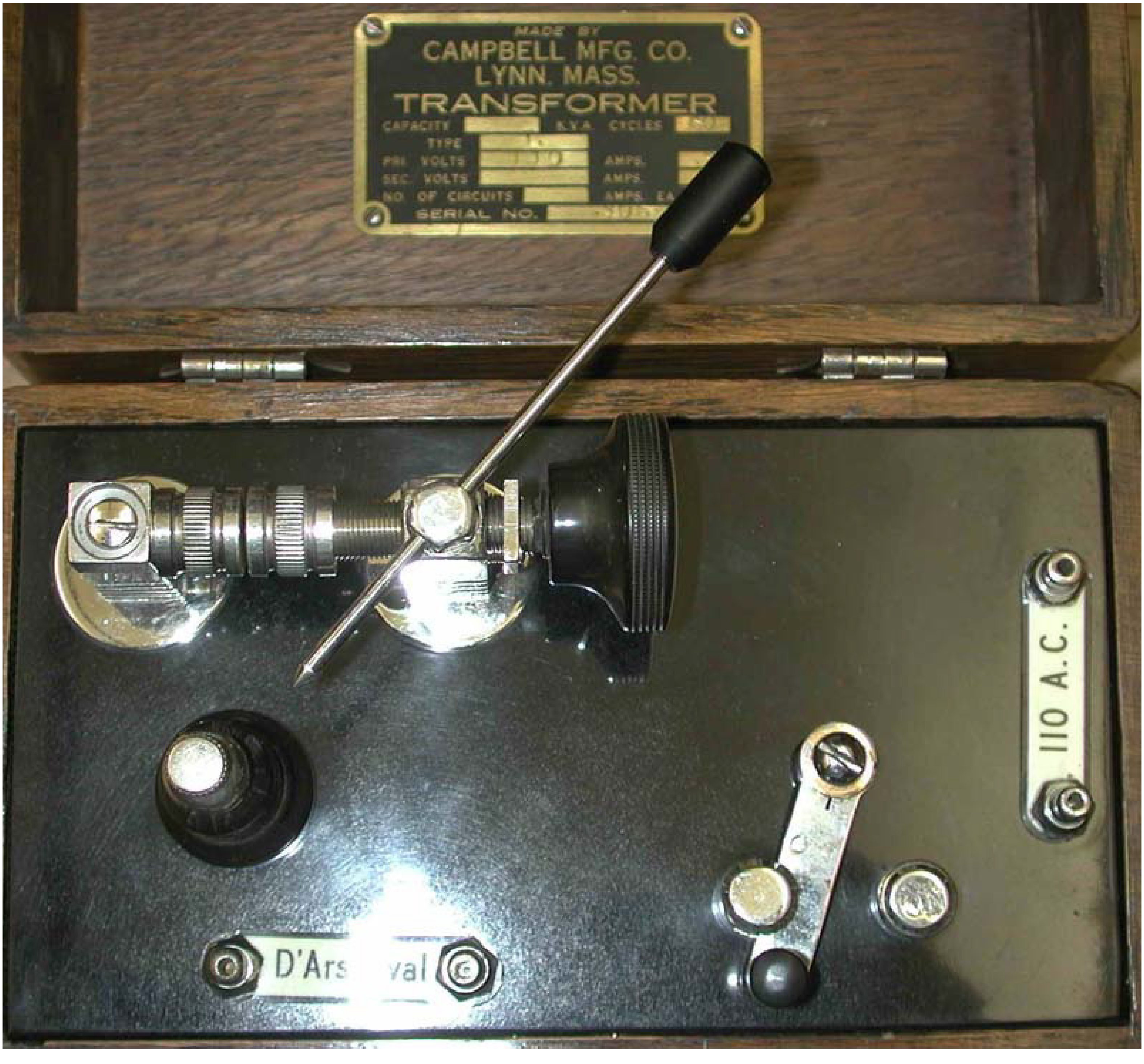


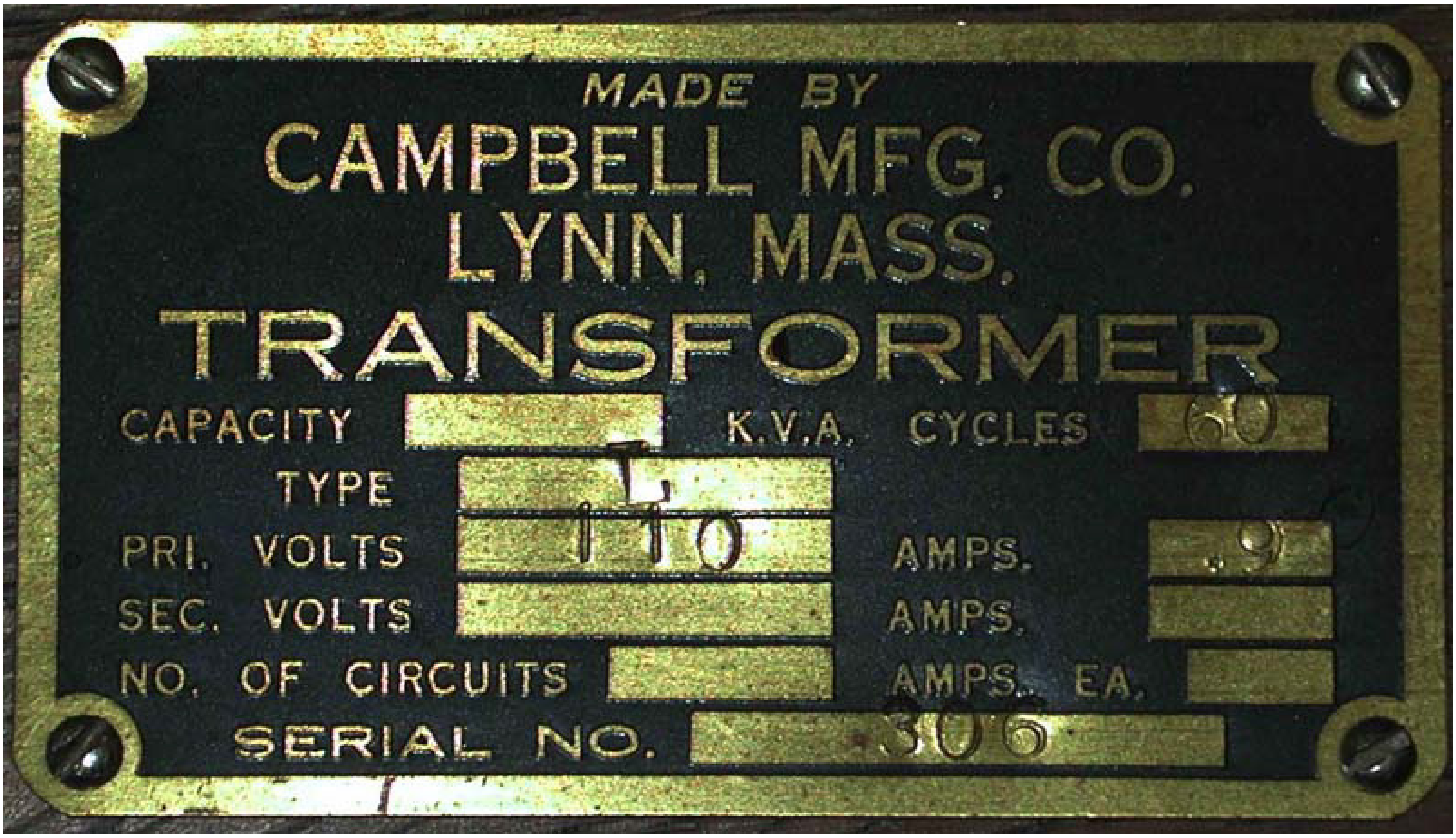

Campbell
REG. U.S. PAT. OFF.
TYPE
NO.
VOLTS
CYCLES
AMP.




STIMULATING
DIATHERMY
COAGULATION


110 A.C.
D'Arsonval


MADE BY
CAMPBELL MFG. CO.
LYNN, MASS.
TRANSFORMER
CAPACITY
K.V.A.
CYCLES
TYPE
PRI. VOLTS
AMPS.
SEC. VOLTS
AMPS.
NO. OF CIRCUITS
AMPS. EA
SERIAL NO.
110 A.C.
D'Arsonval

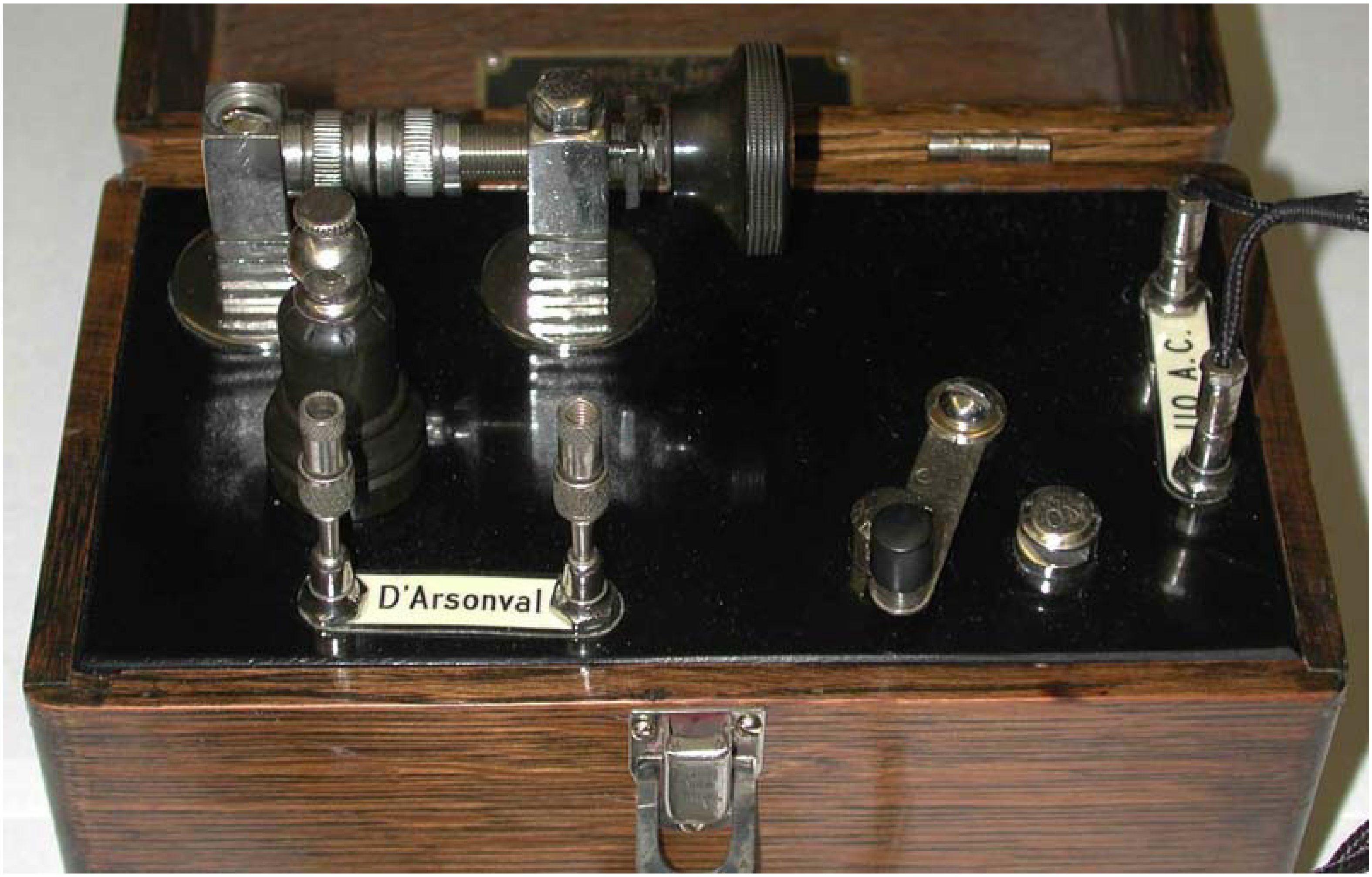


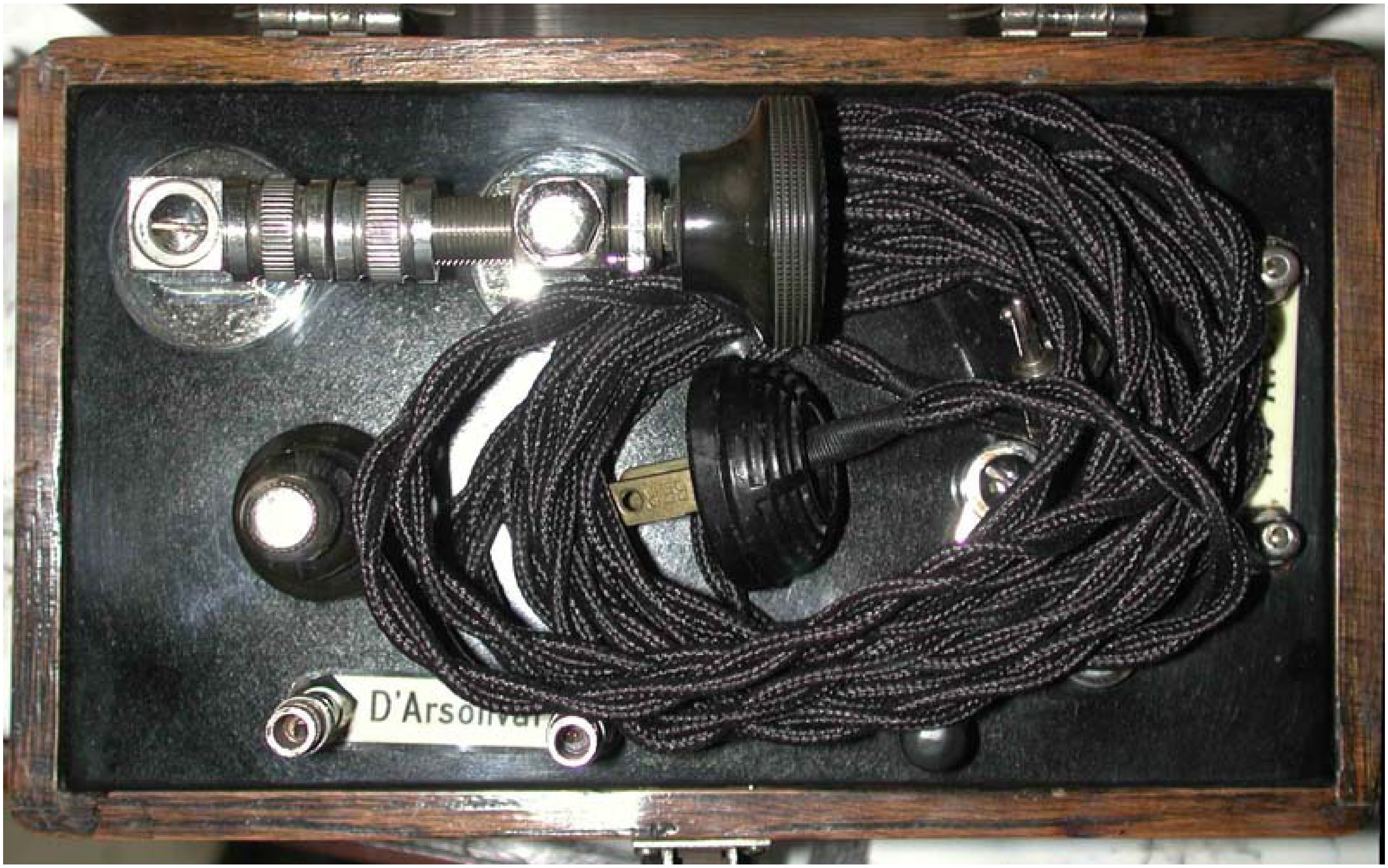
MADE BY

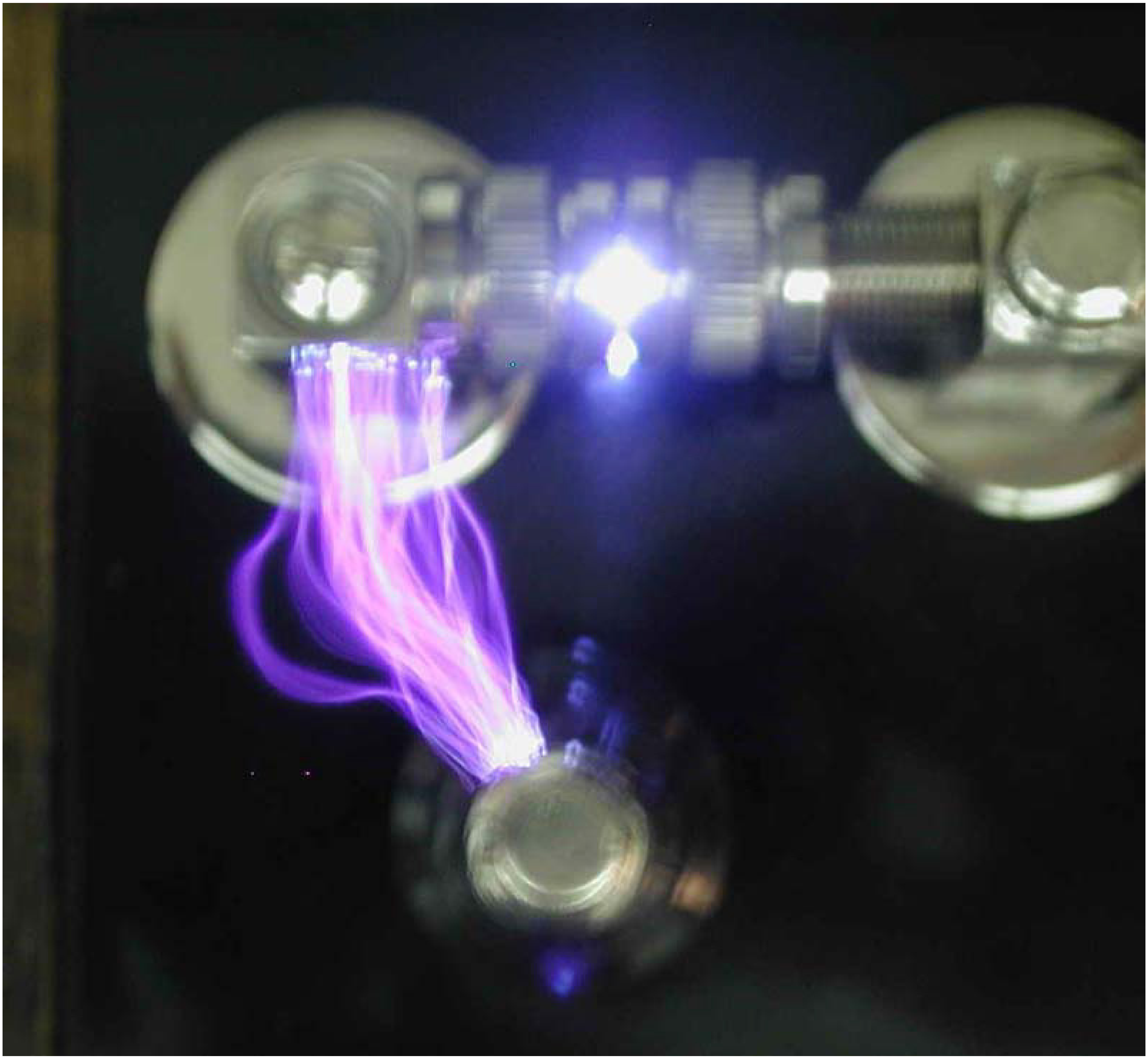
CAMPBELL MFG. CO.
LYNN, MASS.

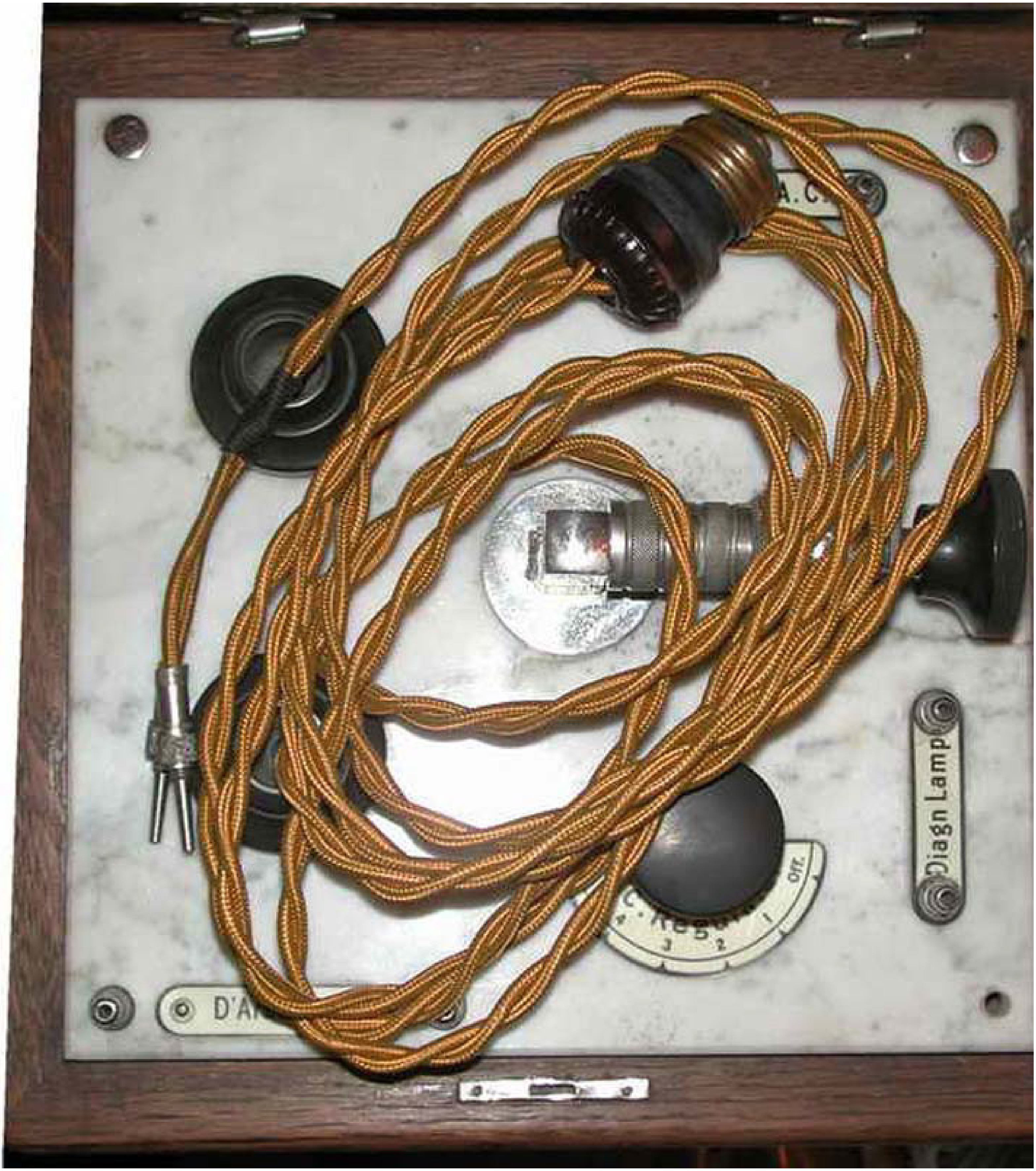
TRANSFORMER

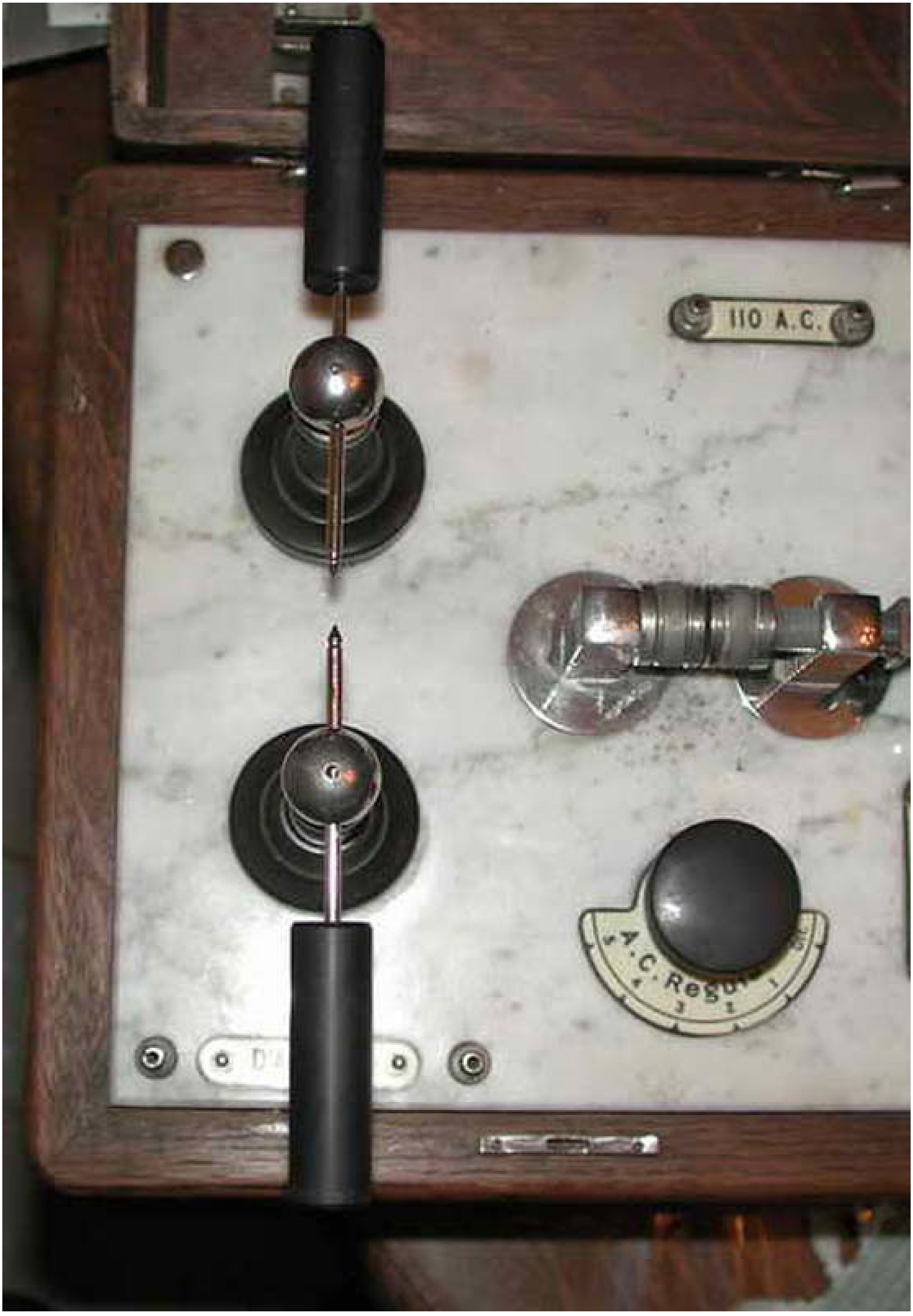
CAPACITY K.V.A. CYCLES 60
TYPE L
PRI. VOLTS 110 AMPS. .9
SEC. VOLTS AMPS.
NO. OF CIRCUITS AMPS. EA.
SERIAL NO. 306

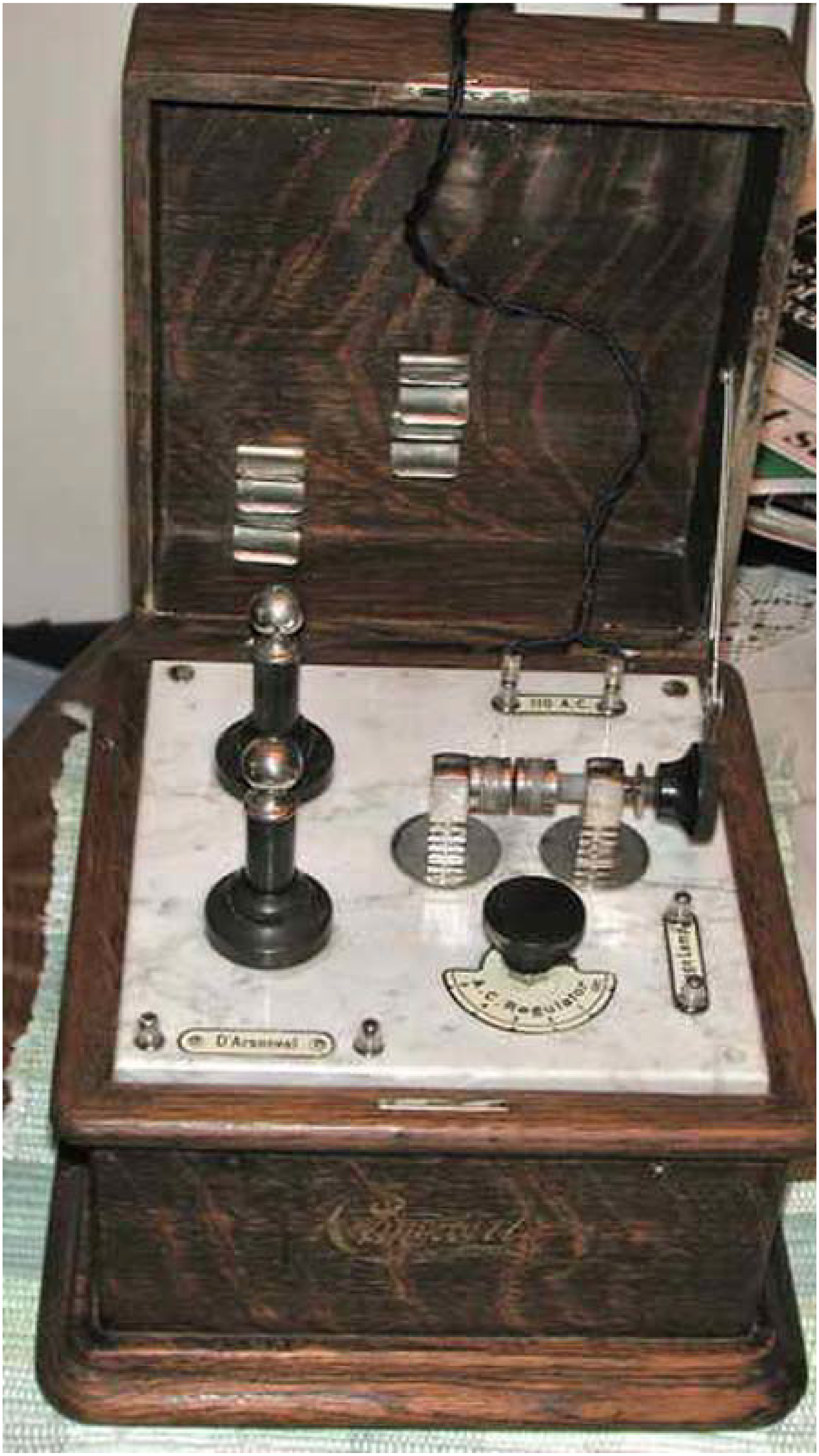

D'Arsonval
110 A.C.

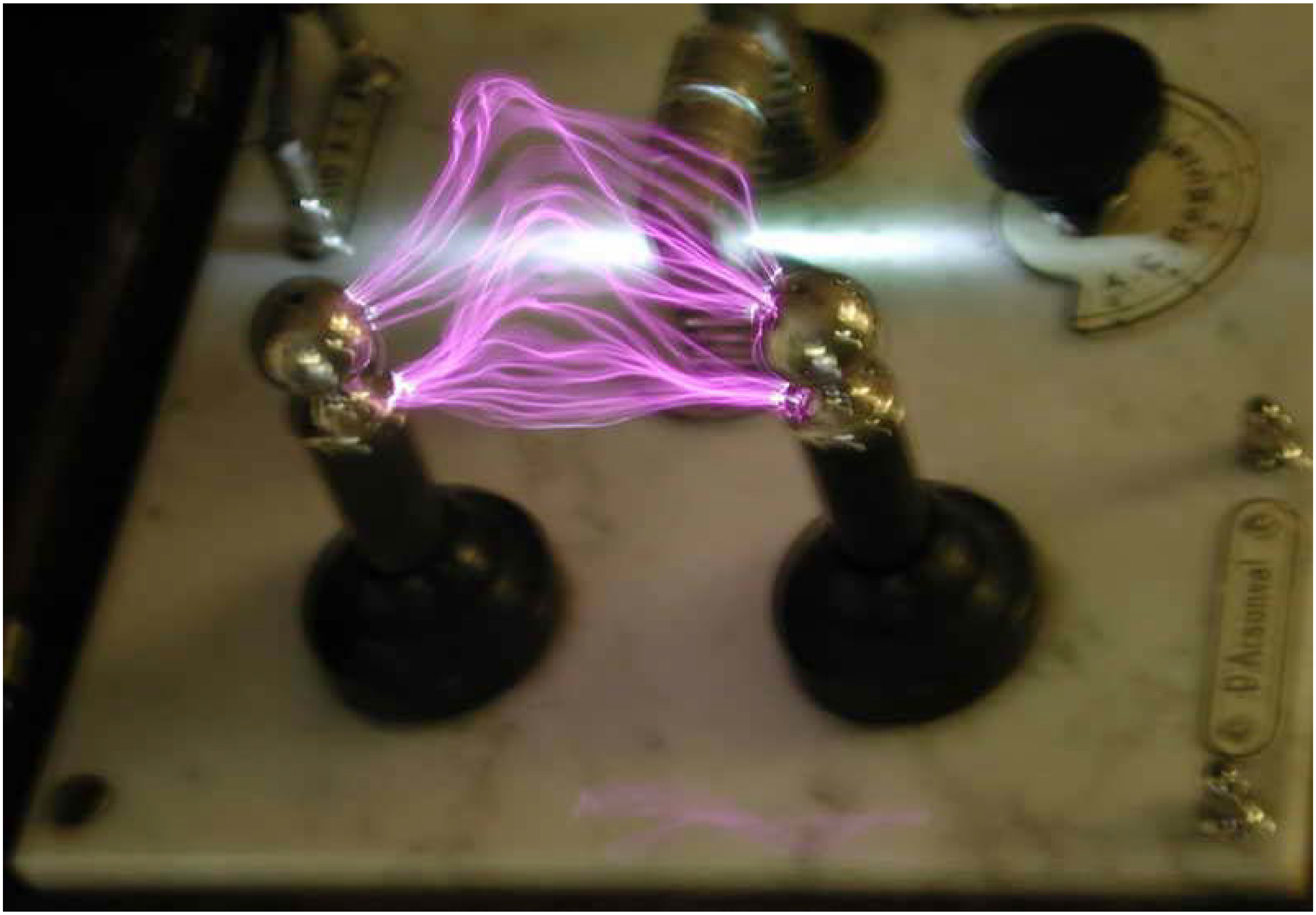

D'Arsonval

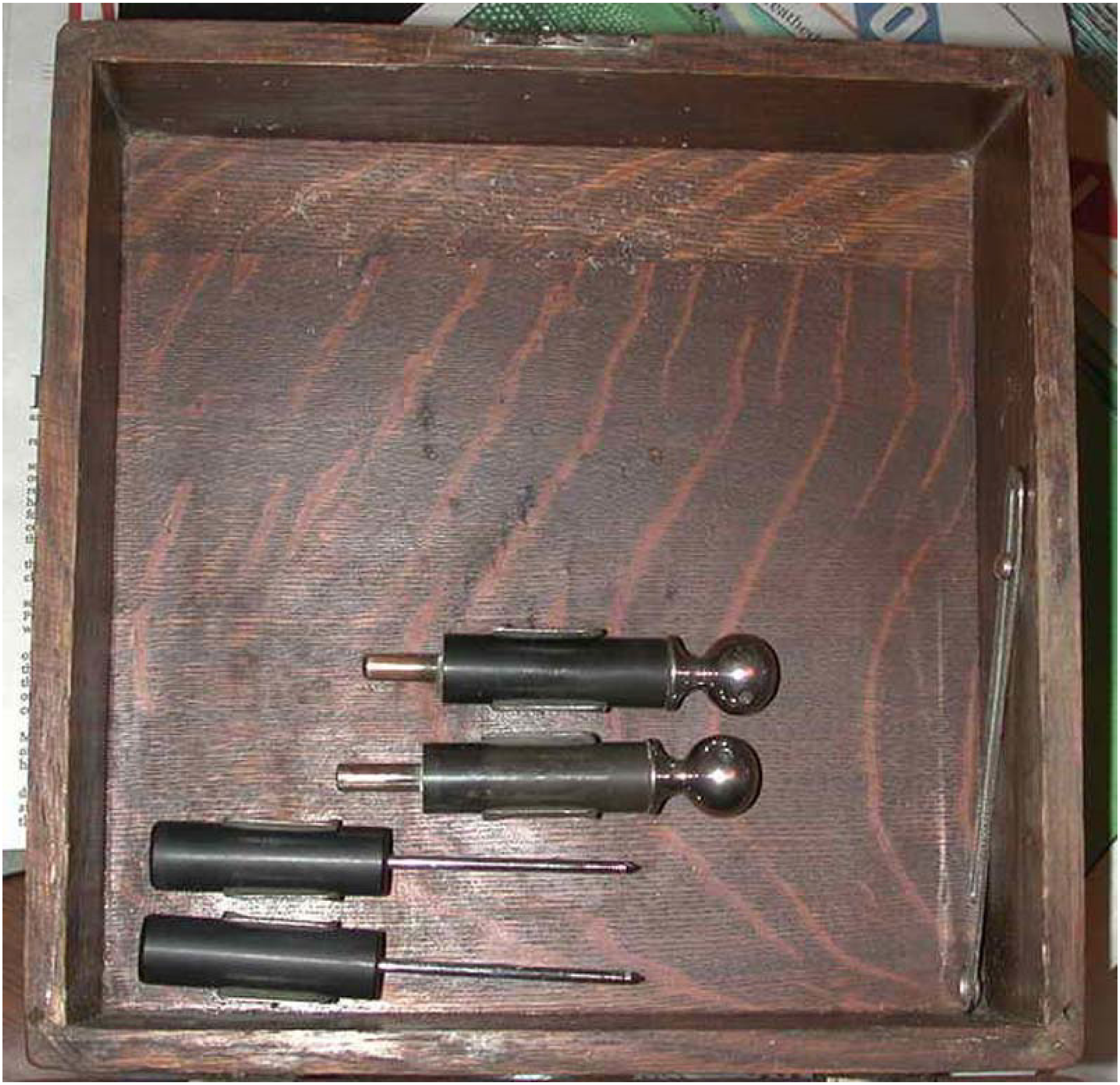


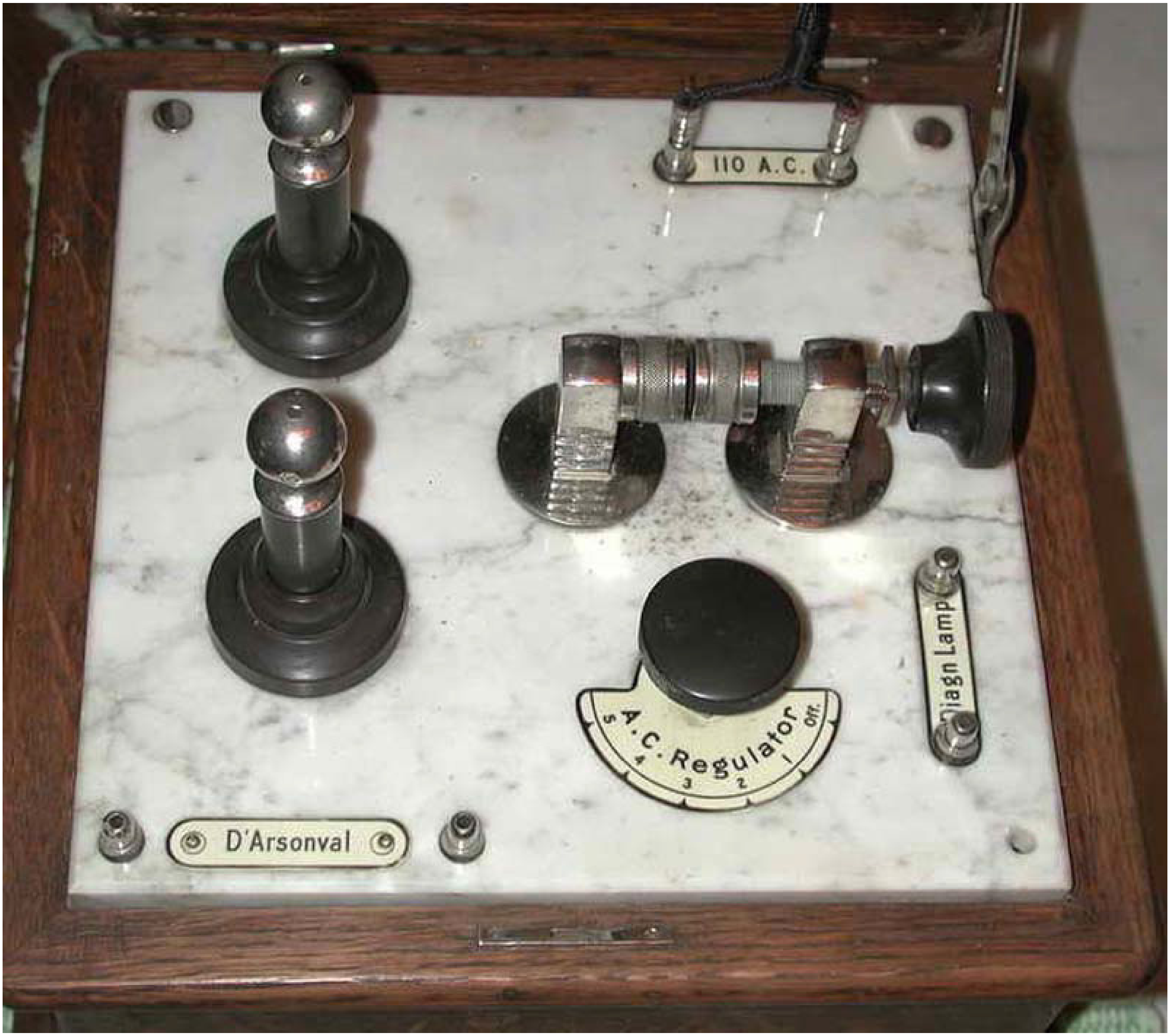

A.C.
Diagn Lamp
D'AR
4 3 2 1 Off

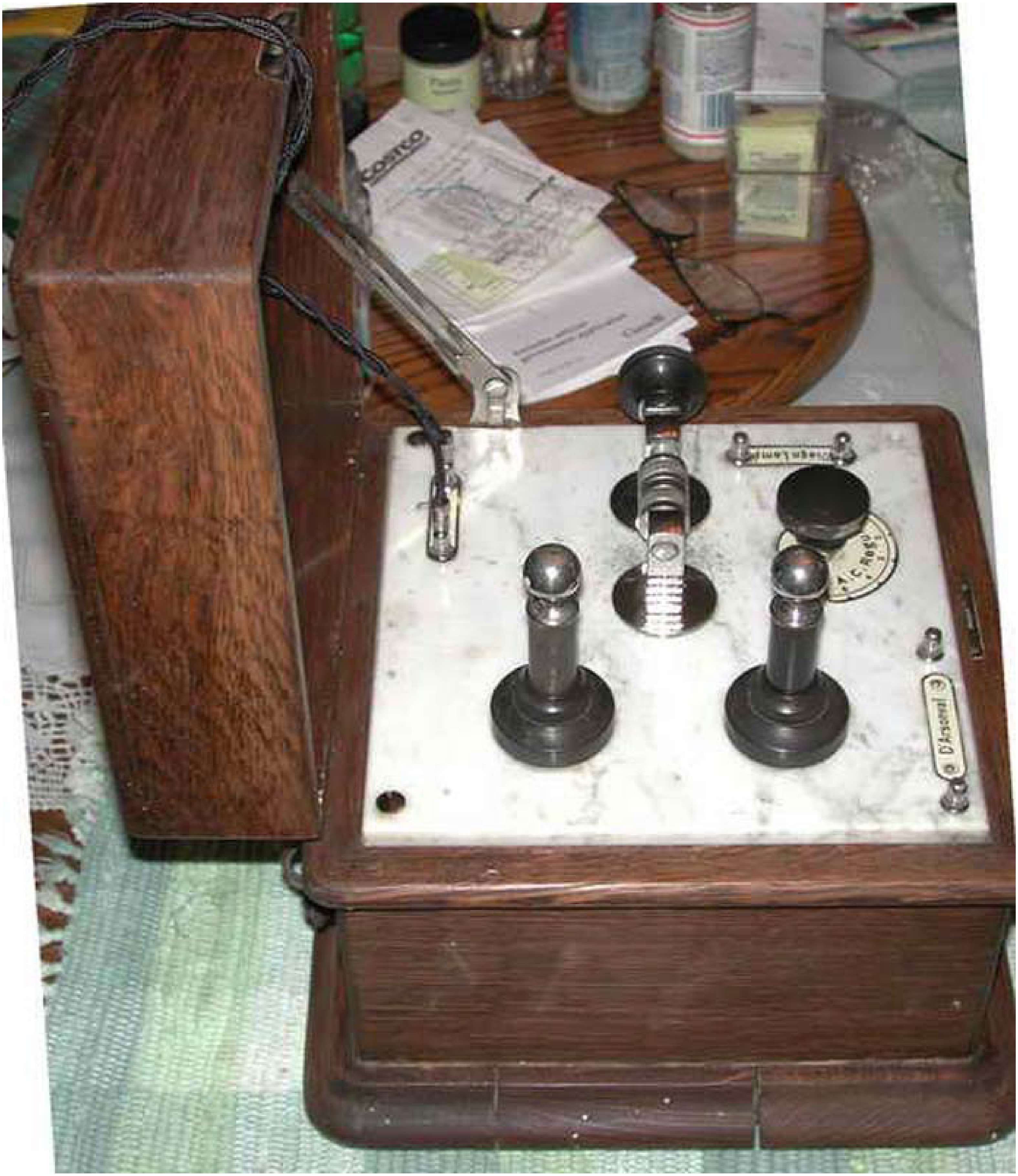

110 A.C.
A.C. Regu
5 4 3 2 1 Off

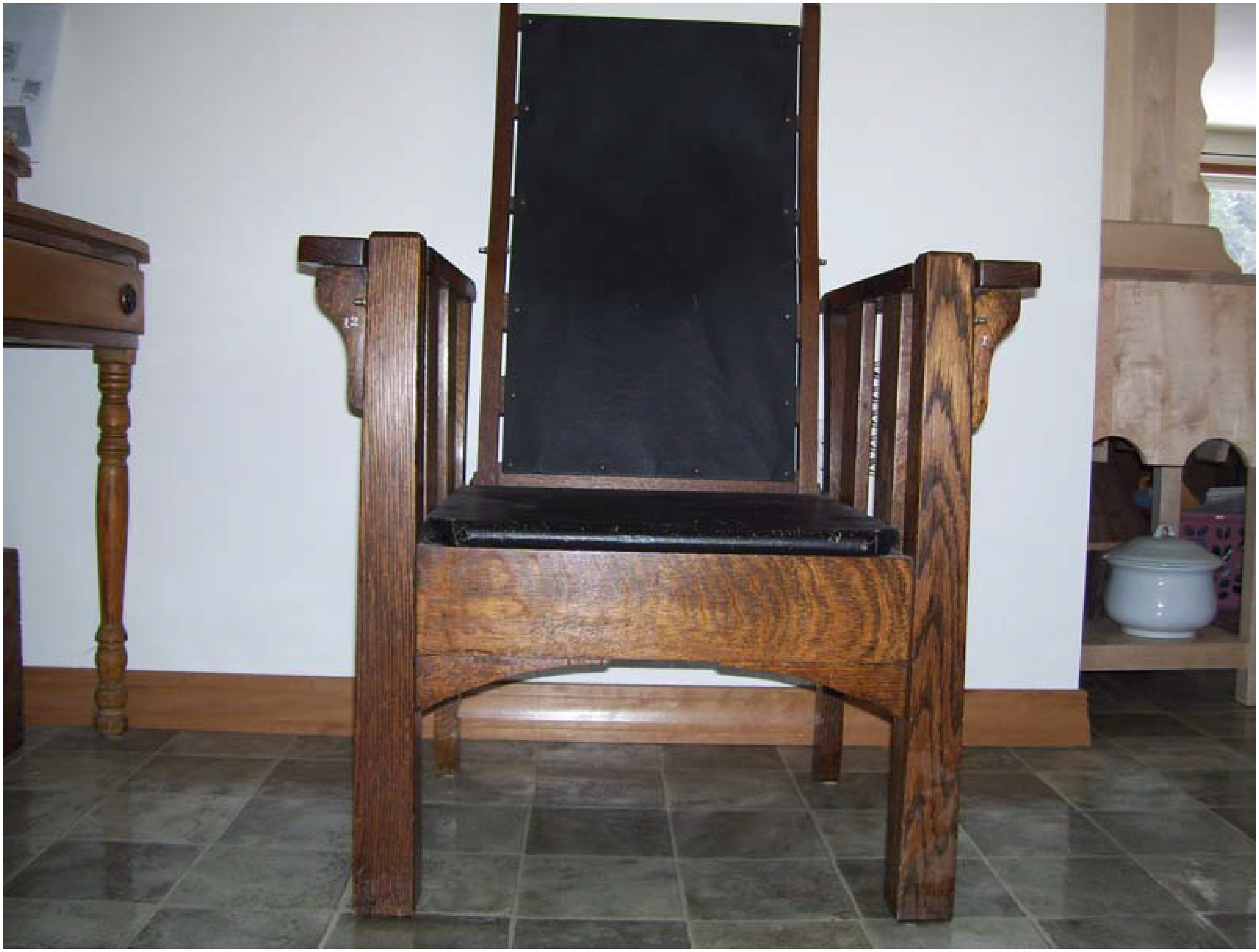

110 A.C.
A.C. Regulator
D'Arsonval

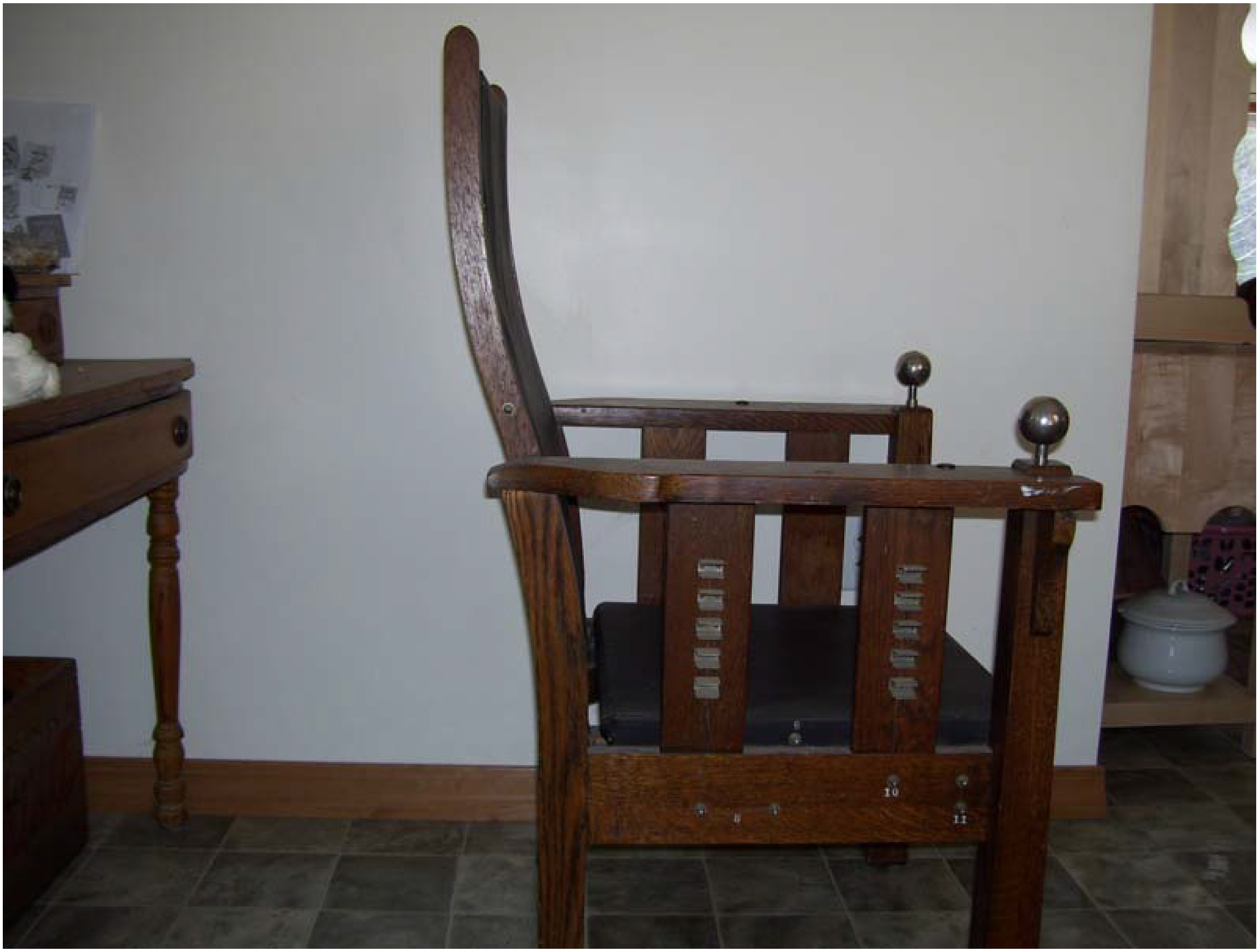

D'Arsonval

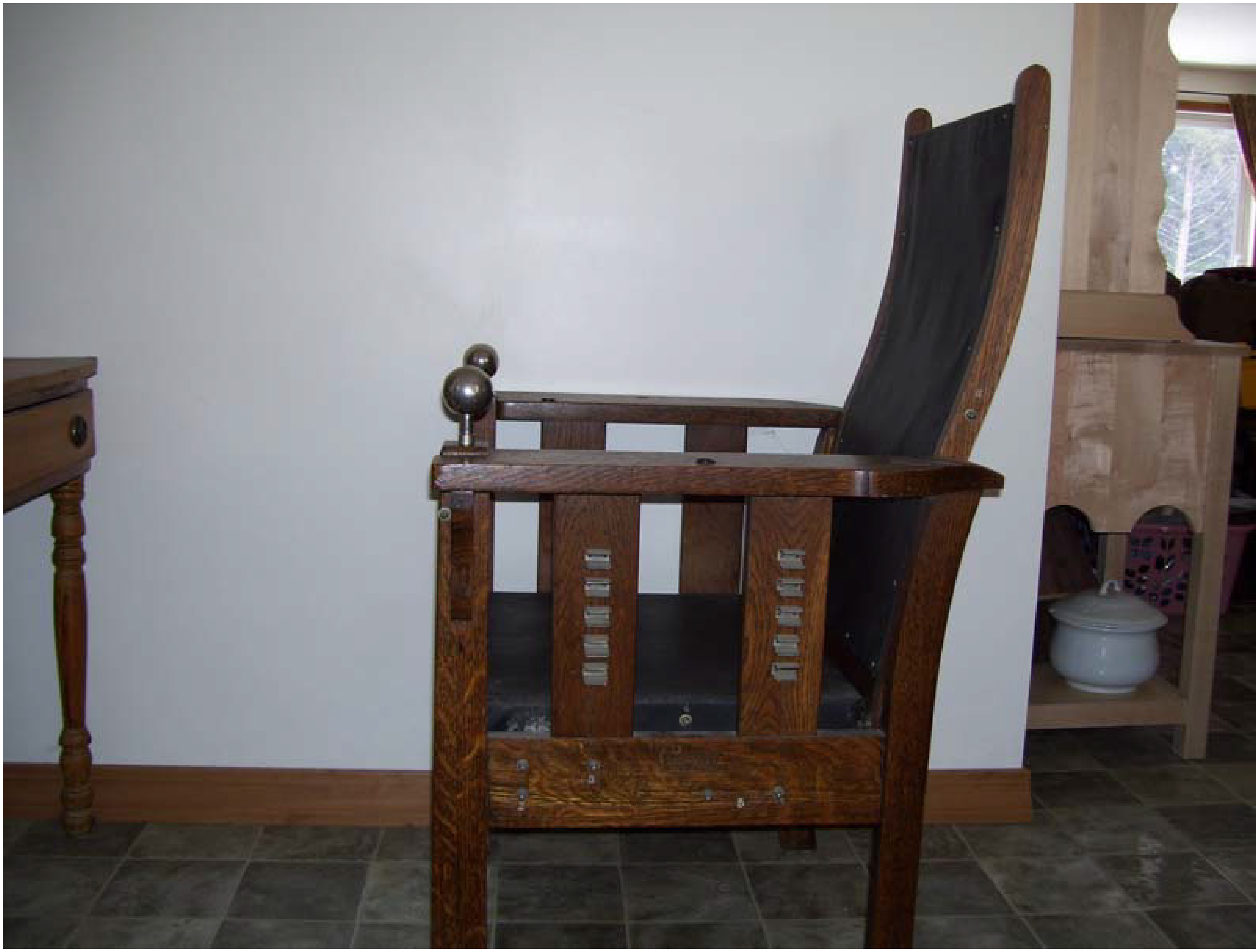


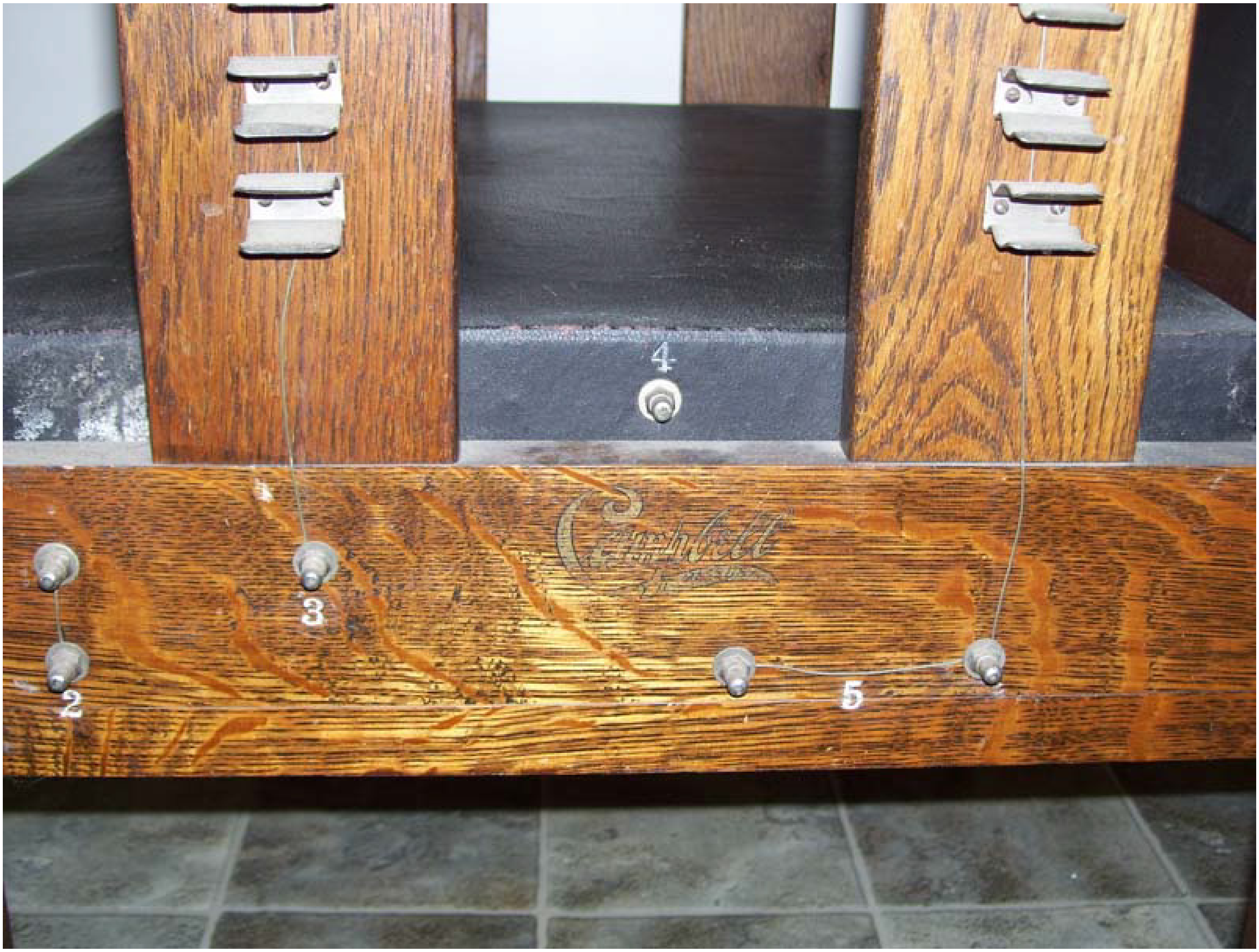

110 A.C.
A.C. Regulator
5
4
3
2
1
OFF.
Diagn Lamp
D'Arsonval

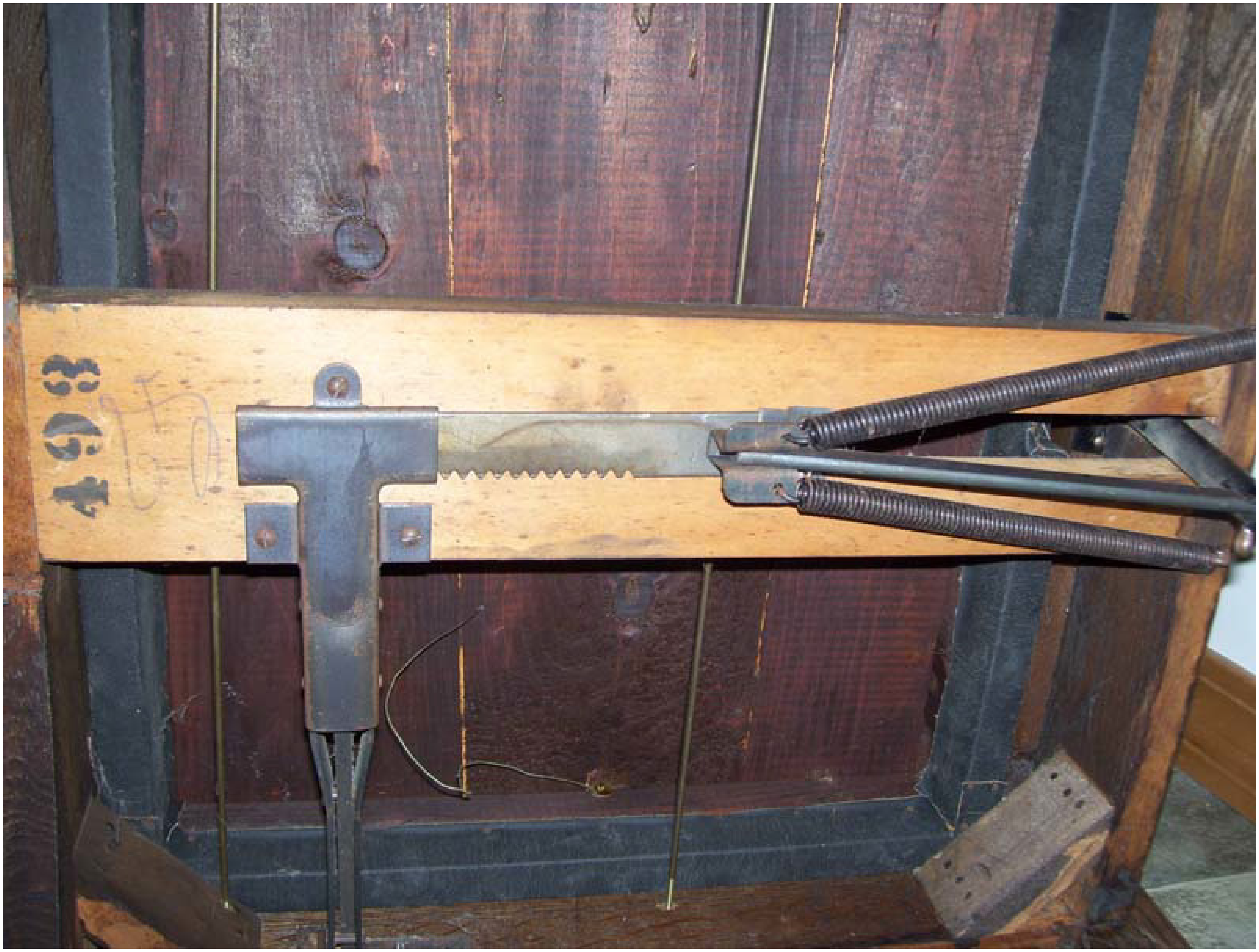

D'Arsonval

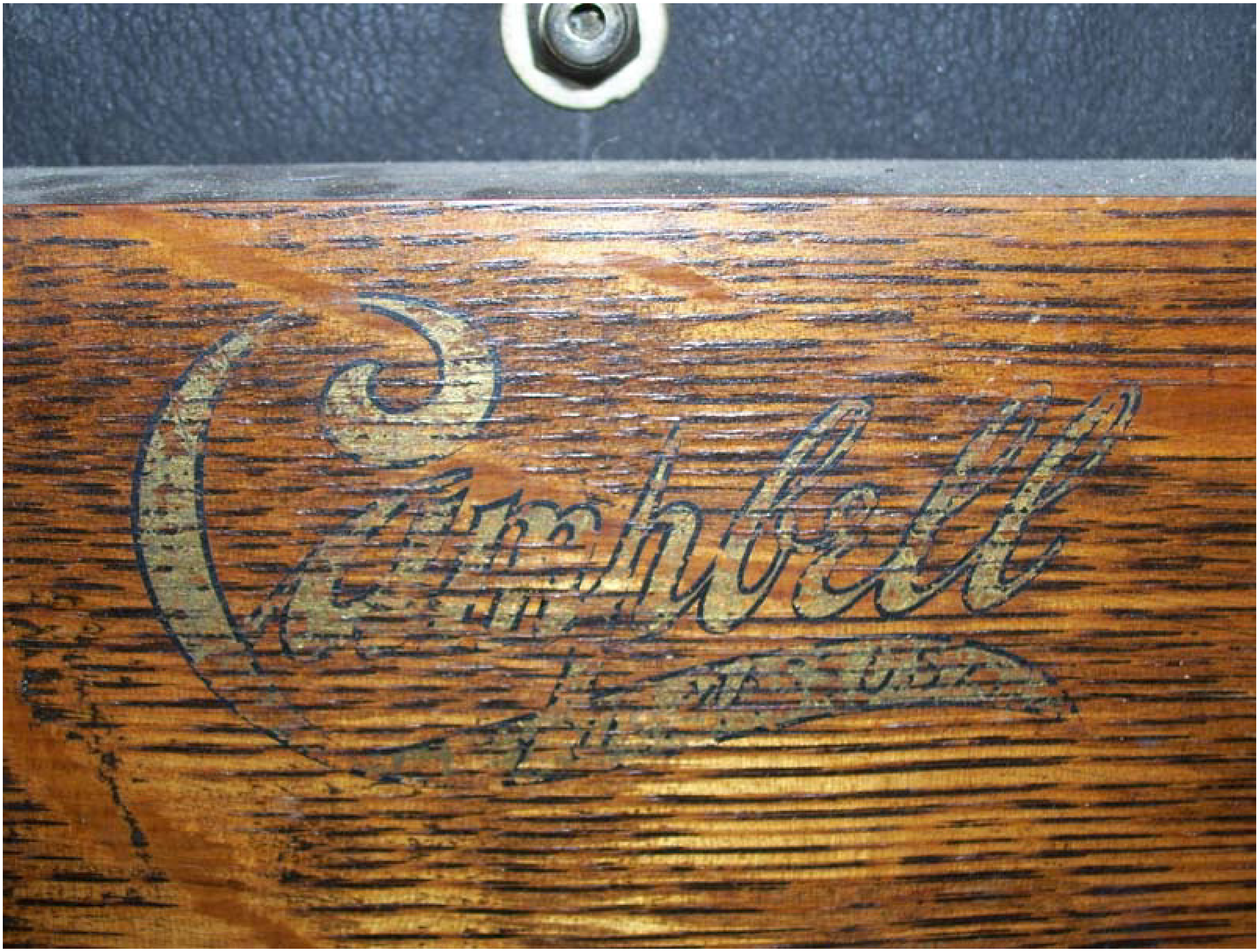

12
1


10
11



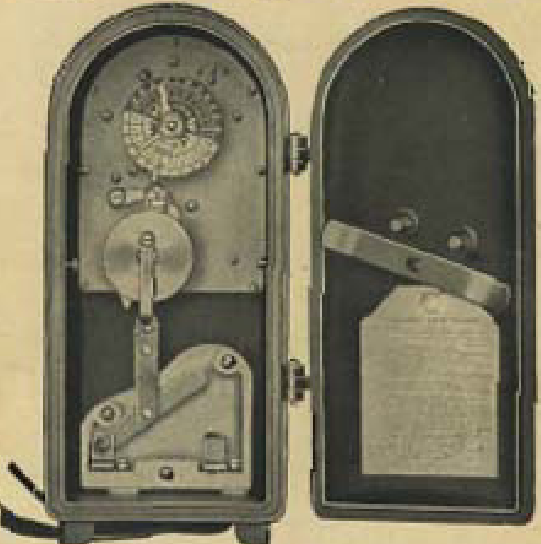

4
Campbell
3
2
5


498


Campbell
U.S.A.

CAMPBELL MANUFACTURING CO., LYNN, MASS.

Campbell Type C, Eight-Day Time Switch



Positive and Dependable

Specifications

Switch.—Since the first electric light and motor service the simplest, most positive and absolutely dependable means of making and breaking the circuits has proven to be the "Knife Switch," which is the type employed in the Campbell Time Switch. Each blade is assembled as a separate unit on a porcelain barrier base. This method makes it possible to furnish double or triple pole switches occupying but a small space and suitable for all standard commercial voltages.

The switch is connected by a lever to the flywheel of clock, which opens and closes it with a quick, positive movement, which never leaves the blades close enough to create an arc.

Outer Case.—Is of cast iron constructed in a manner similar to fire-alarm and police call boxes, suitable for installation out-of-doors. Finish as regularly furnished is black enamel thoroughly baked. The door is provided with handle, which draws it tight to a rubber weatherproofing gasket.

Heat Coils.—Connections are provided in each switch for attachment of heat coils when necessary.

Wire Connections.—Wires are brought out through bottom of the iron case through porcelain bushings, which extend through the iron and are a part of the porcelain switch bases.

Clock.—See description under Type S. E. Switch, page 2. The clock is standard for both switches. Also note list of separate parts on page 4.

Suggestions for Use of Campbell Time Switches, Type "C"

Automatic control of lights in Store Windows, Signs, Stairways, Alleyways, Clocks, Entrances, Whiteways, Poultry-houses.

Melting Pots—Electrically heated, for lead or glue, may be turned on automatically early in the morning and be ready for use at starting time.

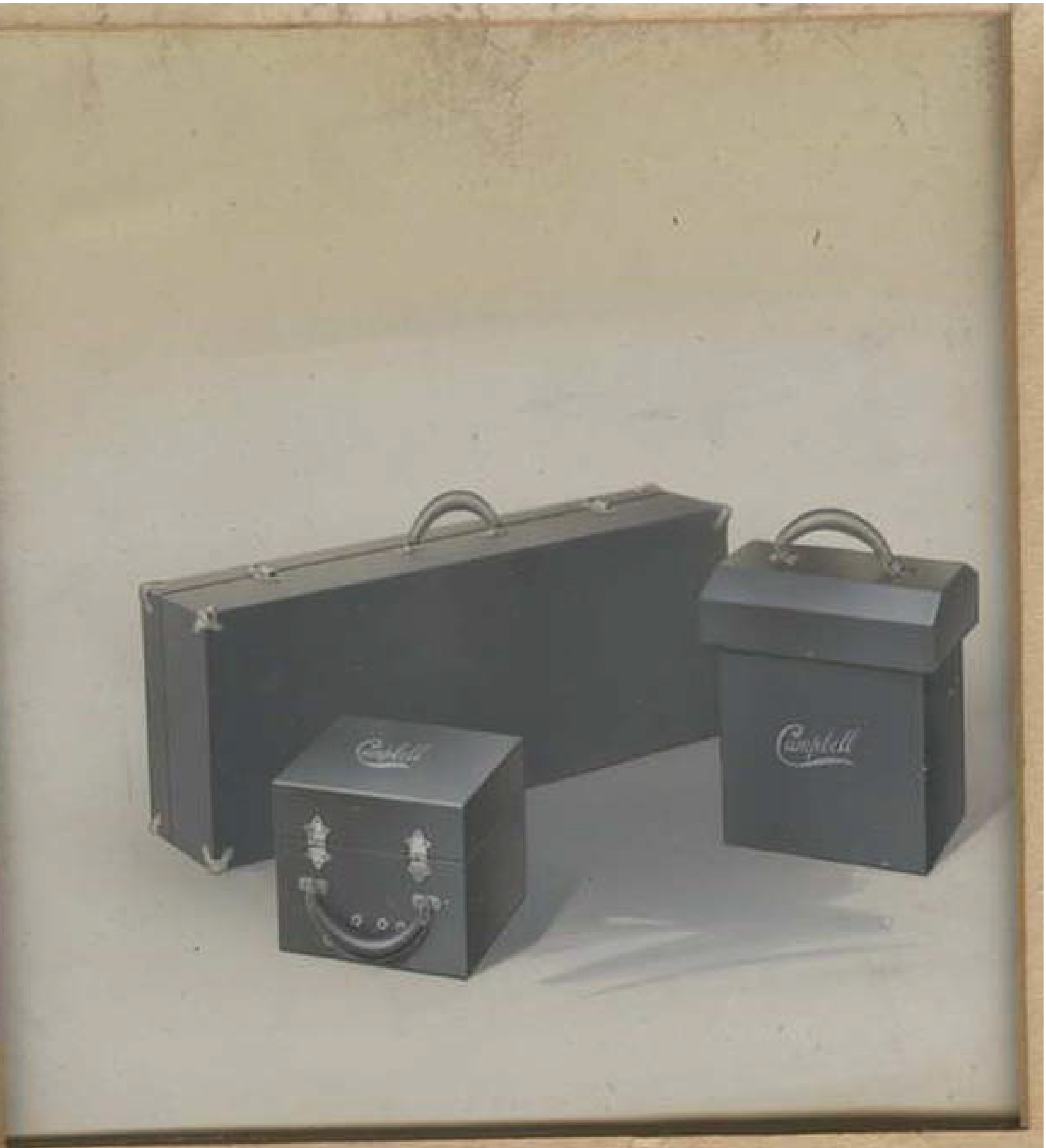
TYPE "C"—EIGHT DAY

(ON and OFF Daily)

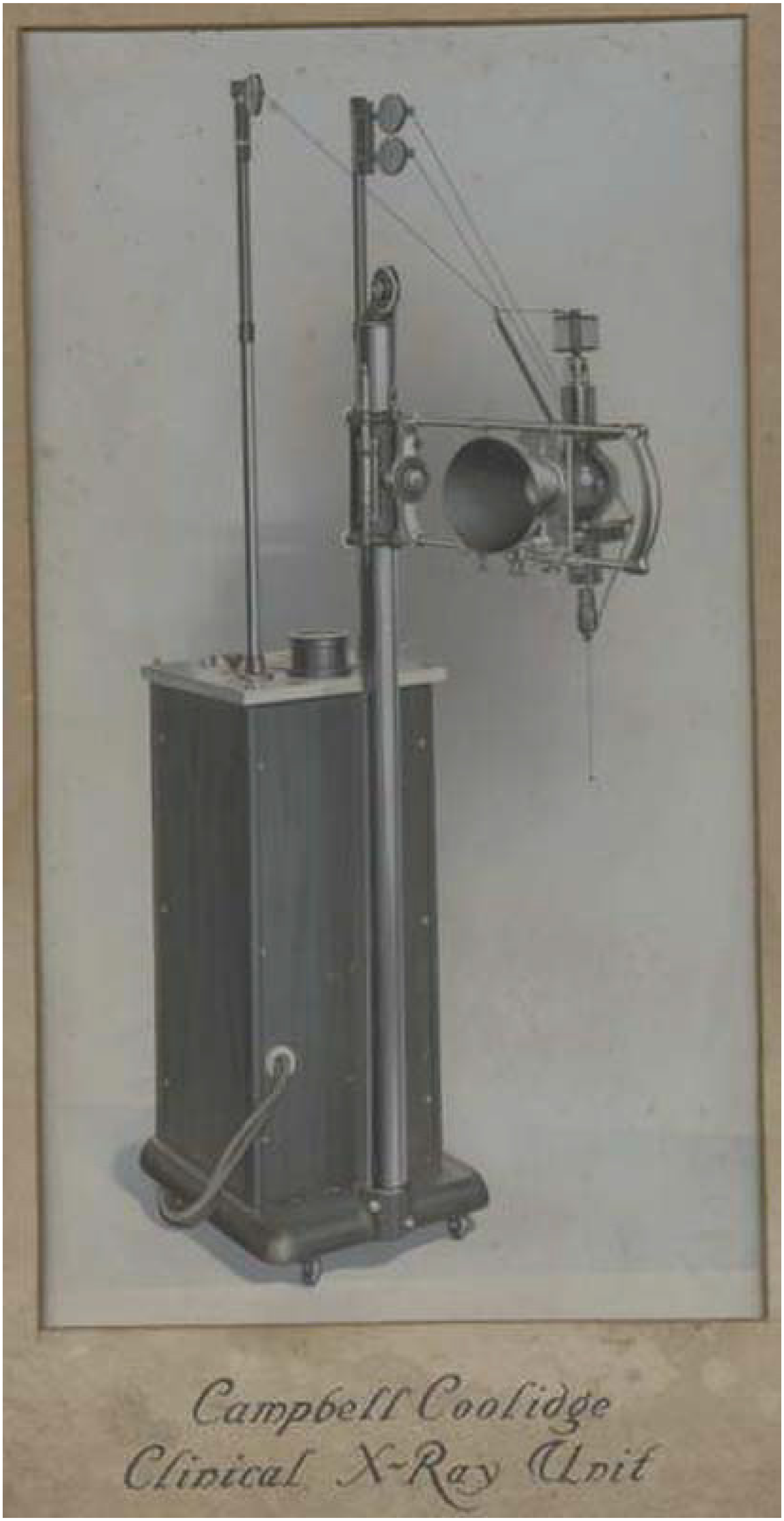
Height 15"—Width 7"—Depth 5"—Shipping weight 38 pounds

For the Ordinary Installation, such as Store Windows, Signs, Entrances, Multiple Street Lights, Storage Battery Recharging, etc. For more than 60 amp. use any standard make of magnet switch in connection with Type C No. 101.

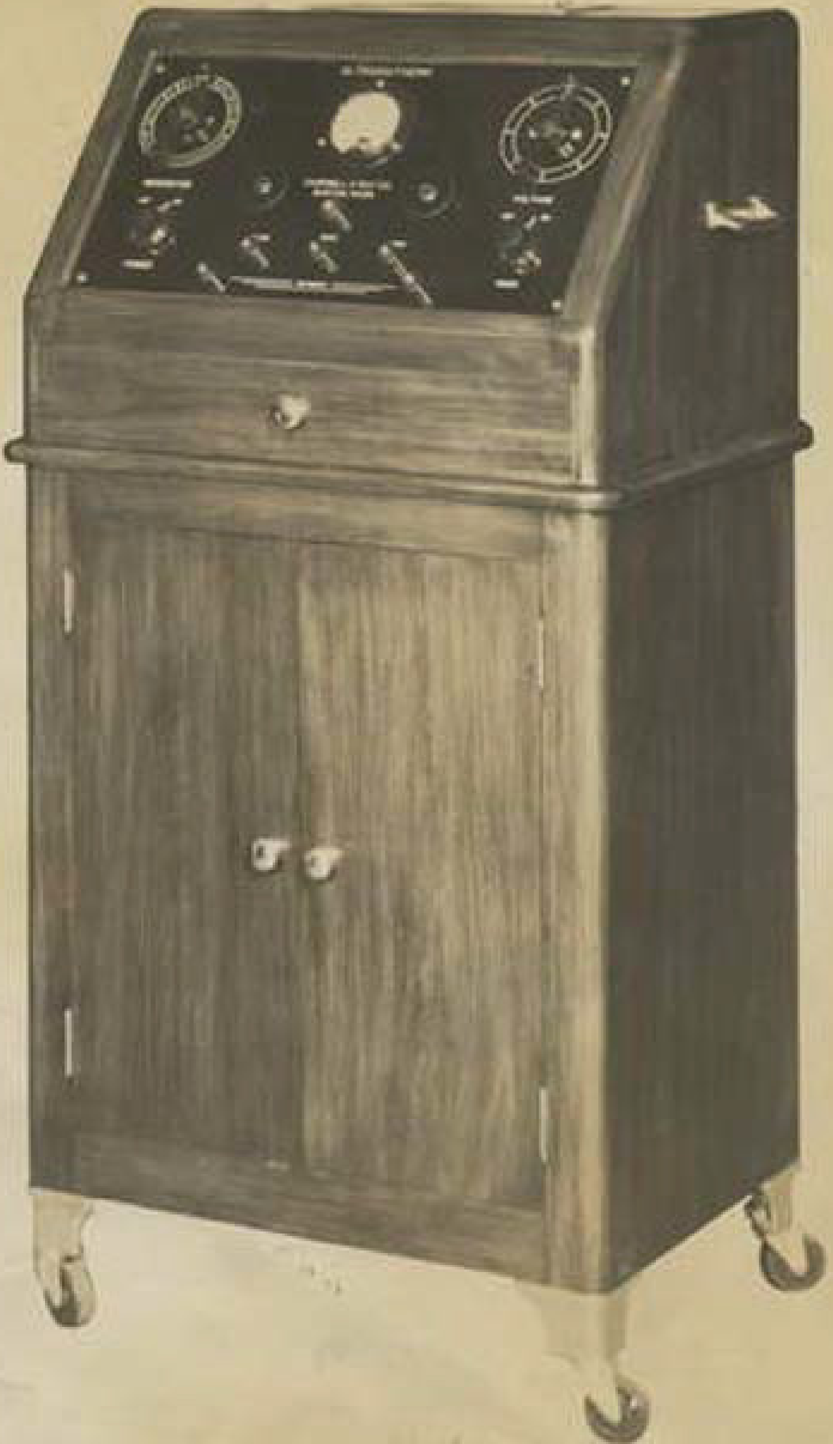
1101	30 amp., Double Pole	250 V.	$60.00
1102	60 amp., Double Pole	250 V.	65.00
1108	30 amp., Triple Pole	250 V.	62.00
1109	60 amp., Triple Pole	250 V.	66.00

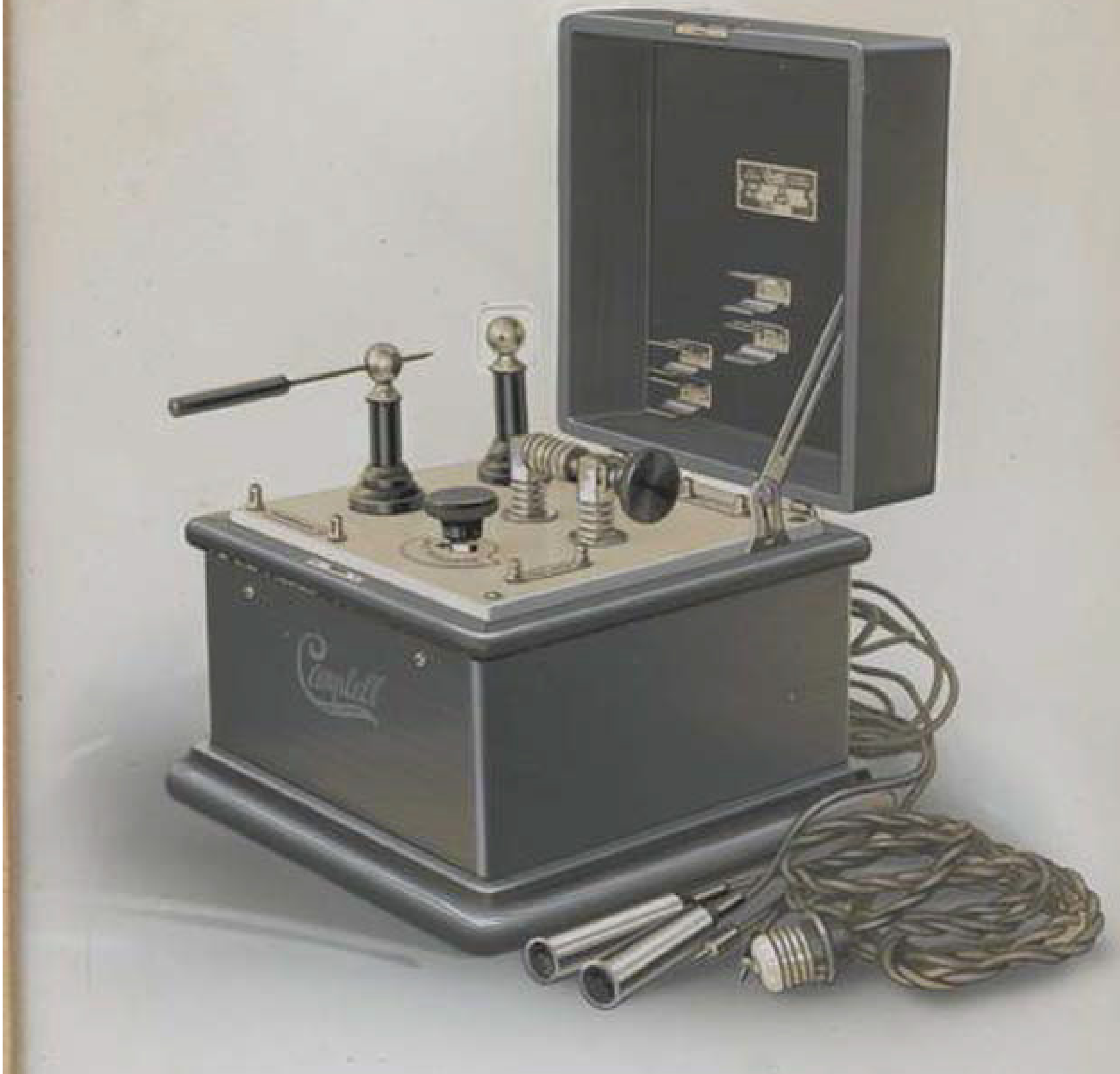

Campbell
Campbell

Campbell Clinette
Closed

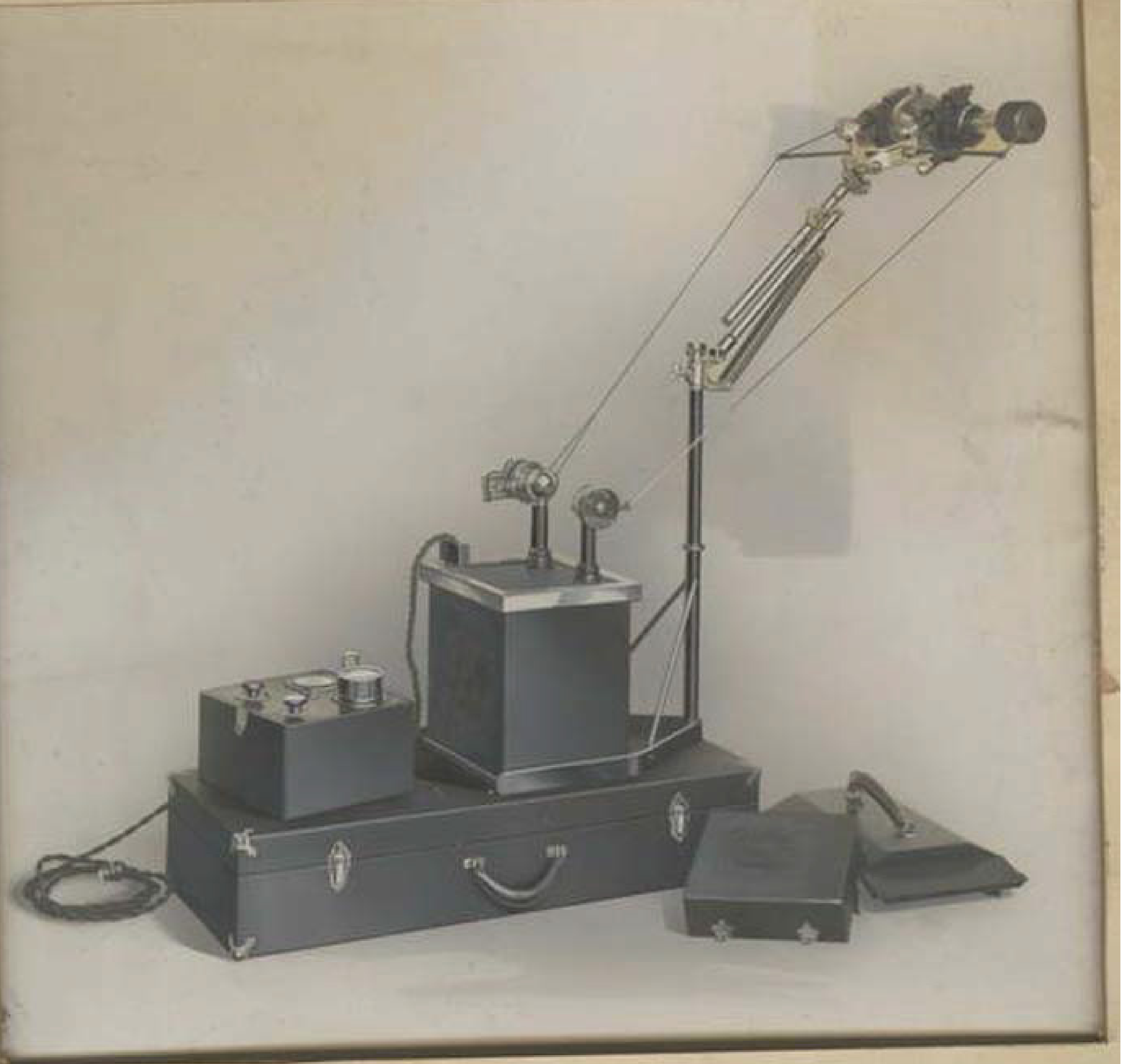


Campbell Coolidge
Clinical X-Ray Unit

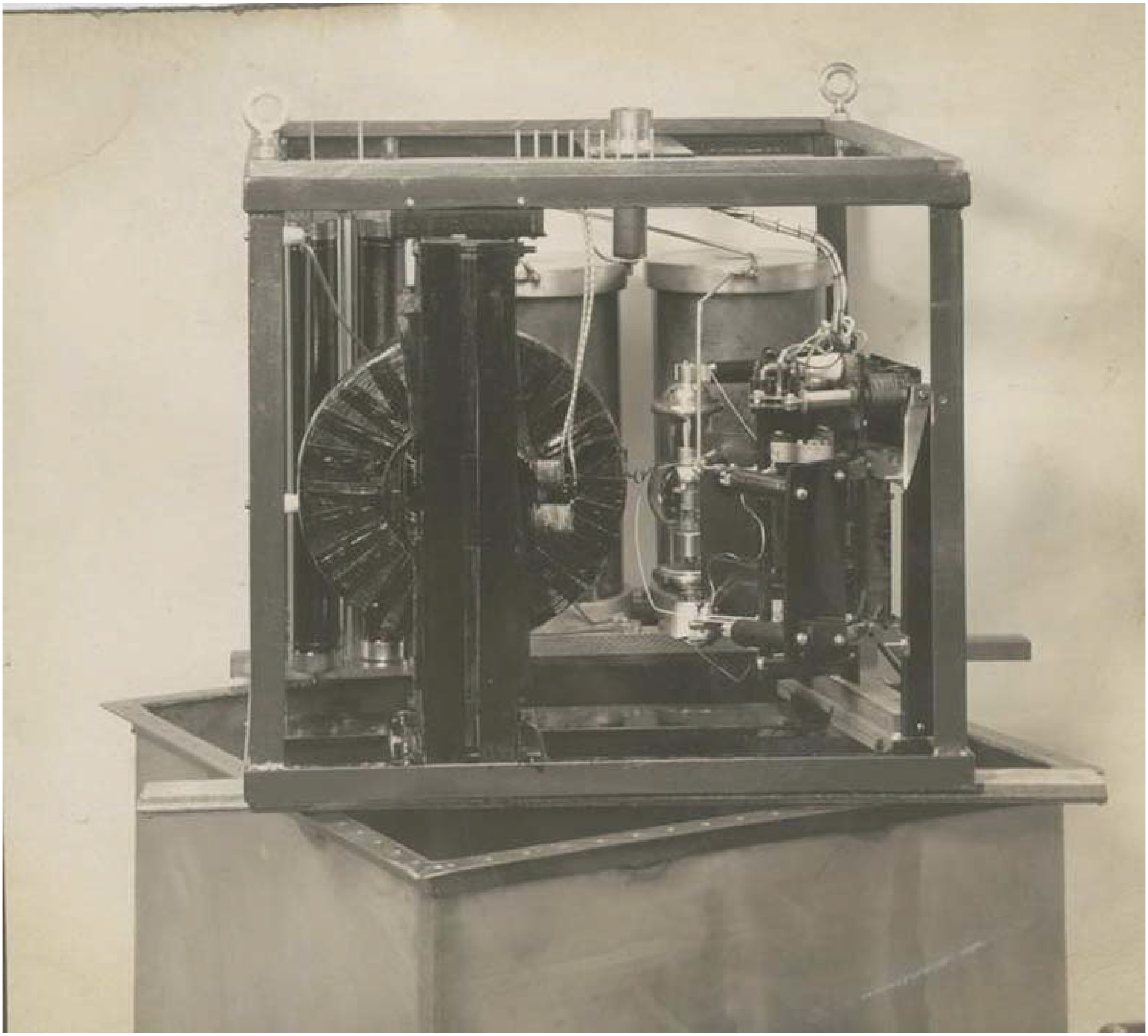


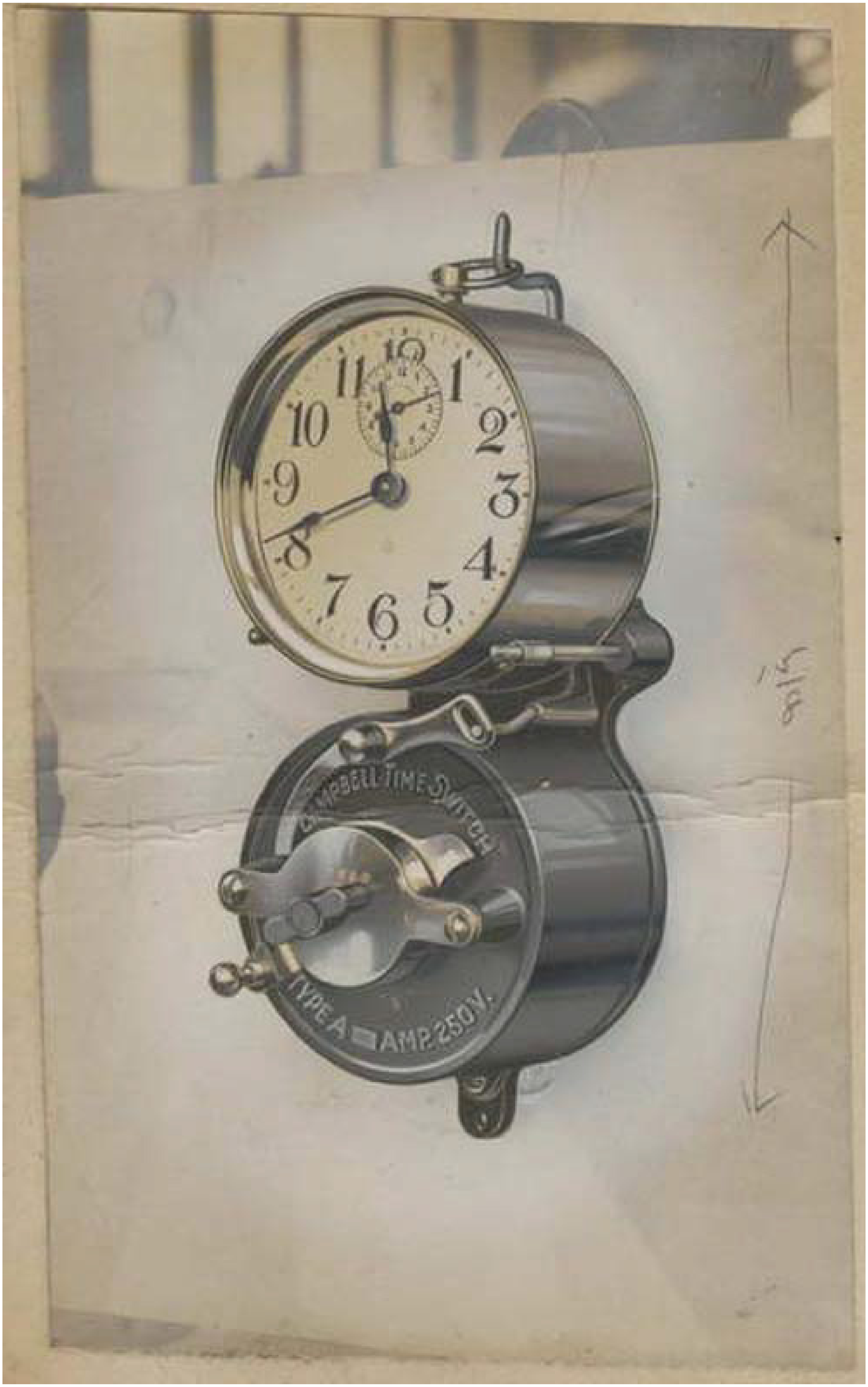


Campbell Model H Coil

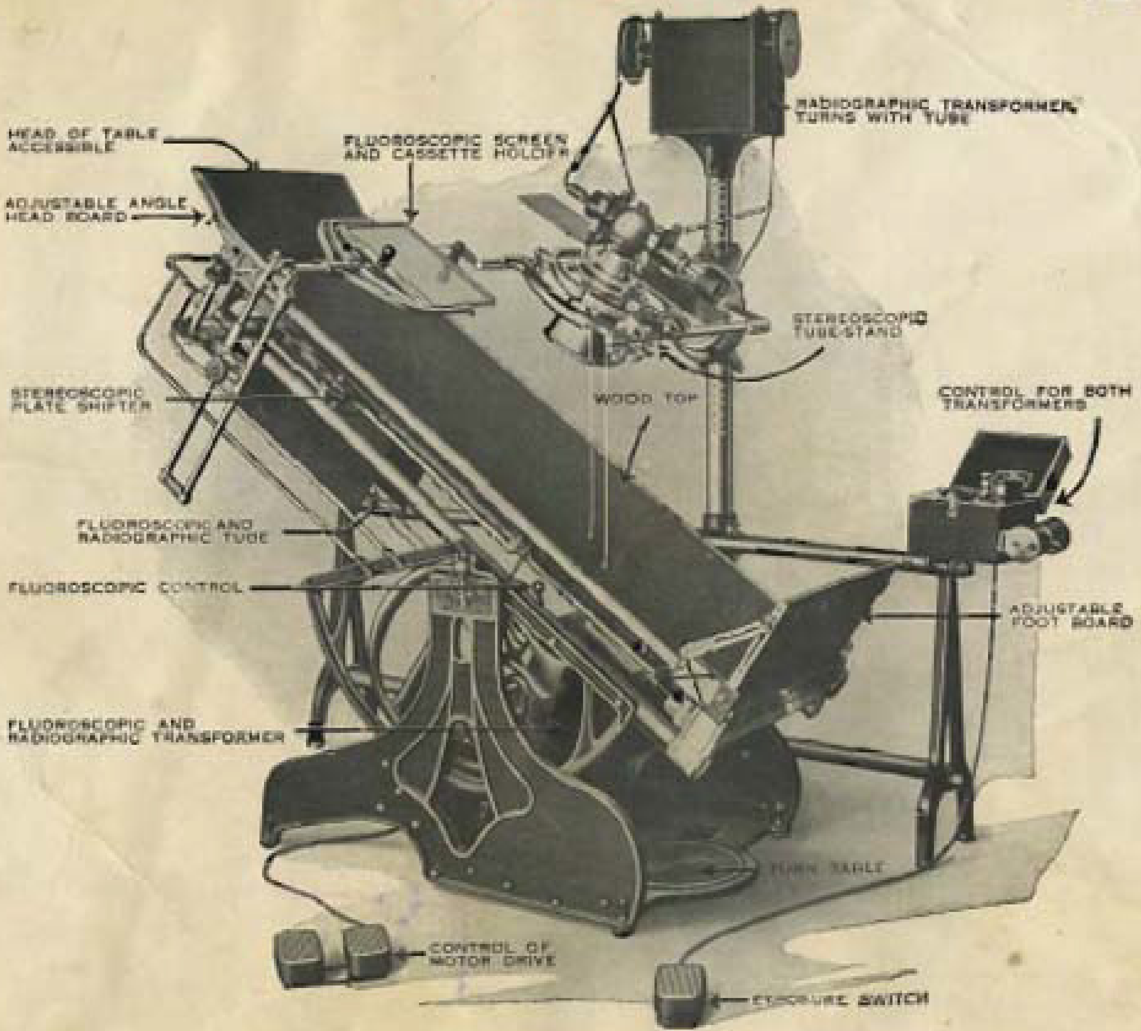


CAMPBELL PORTABLE
IN CASE




CAMPBELL TIME SWITCH
TYPE A AMP. 250 V.
5/8

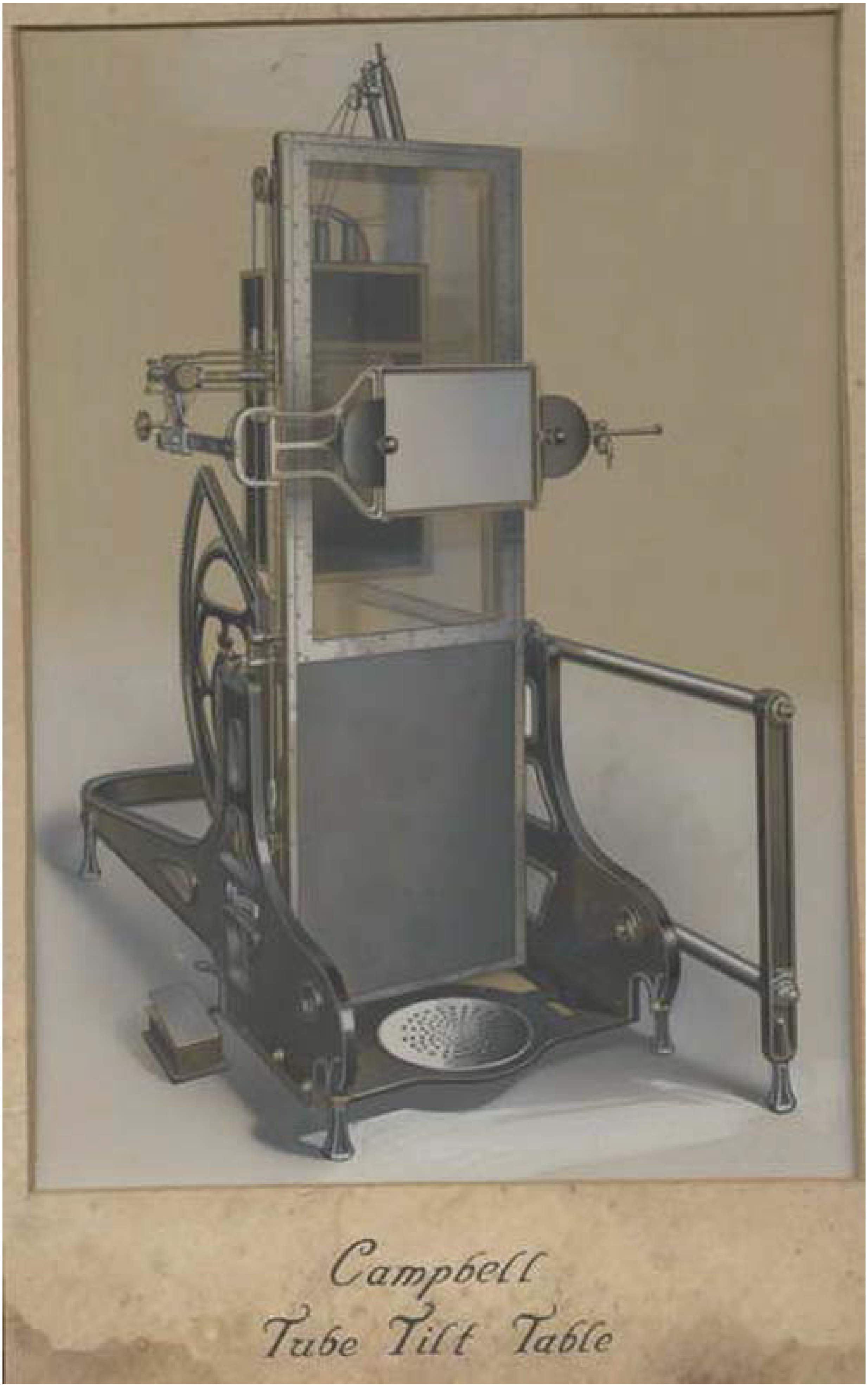
Clinix — TROLLEYLESS — **X-Ray Plant**


HEAD OF TABLE ACCESSIBLE
ADJUSTABLE ANGLE HEAD BOARD
FLUOROSCOPIC SCREEN AND CASSETTE HOLDER
RADIOGRAPHIC TRANSFORMER TURNS WITH TUBE
STEREOSCOPIC TUBE-STAND
STEREOSCOPIC PLATE SHIFTER
WOOD TOP
CONTROL FOR BOTH TRANSFORMERS
FLUOROSCOPIC AND RADIOGRAPHIC TUBE
FLUOROSCOPIC CONTROL
ADJUSTABLE FOOT BOARD
FLUOROSCOPIC AND RADIOGRAPHIC TRANSFORMER
TURN TABLE
CONTROL OF MOTOR DRIVE
EXPOSURE SWITCH

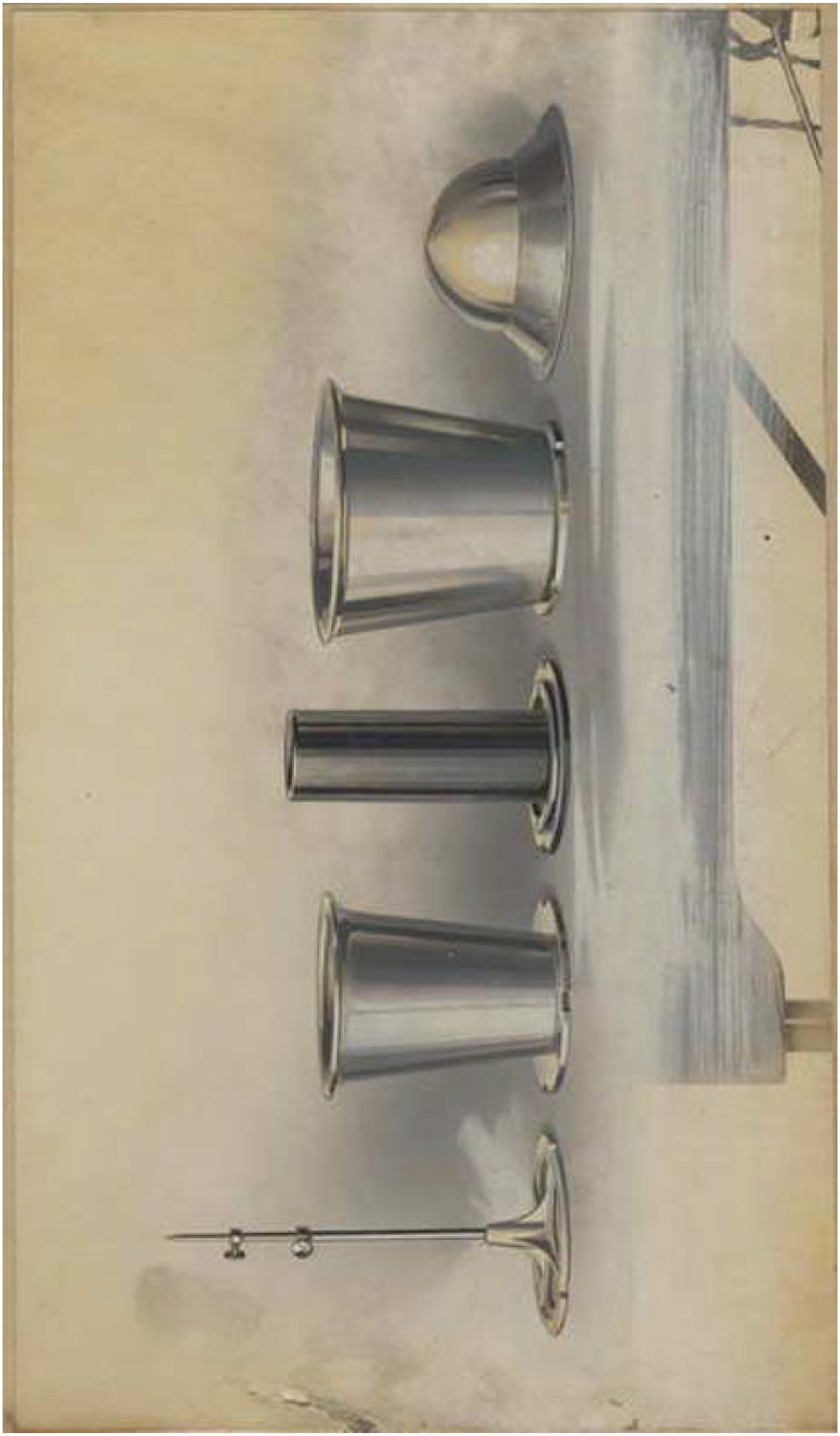
U. S. Patents
December 19, 1911; April 22, 1913; February 29, 1916; August 7, 1917.
Foreign Patents. Other Patents Pending.

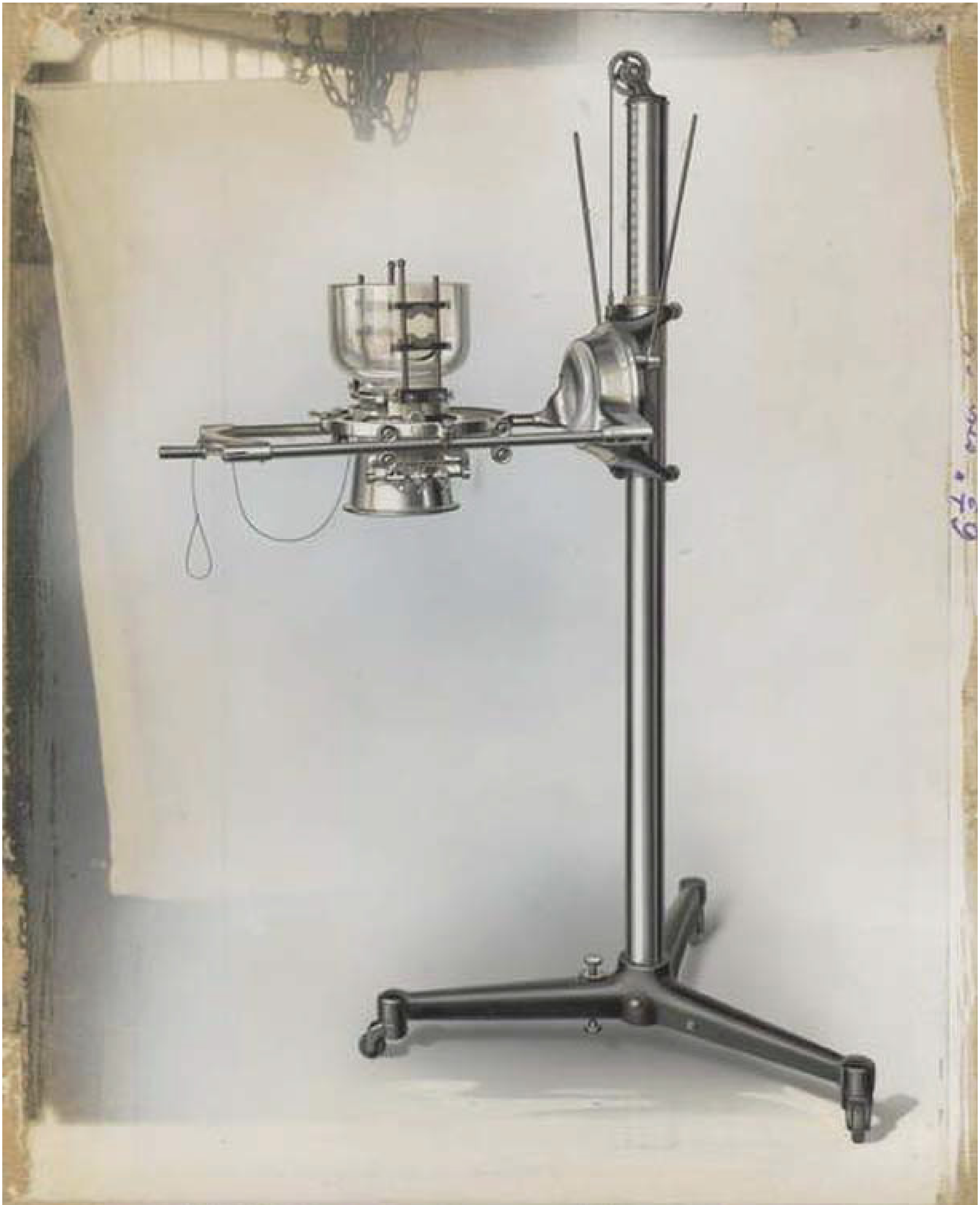
Campbell Electric Co.
LYNN, MASS.
Service Stations
in Principal Cities

MEDAL OF HONOR
HIGHEST AWARD
X-ray and High Frequency Apparatus
Panama-Pacific International Exposition
San Francisco, 1915



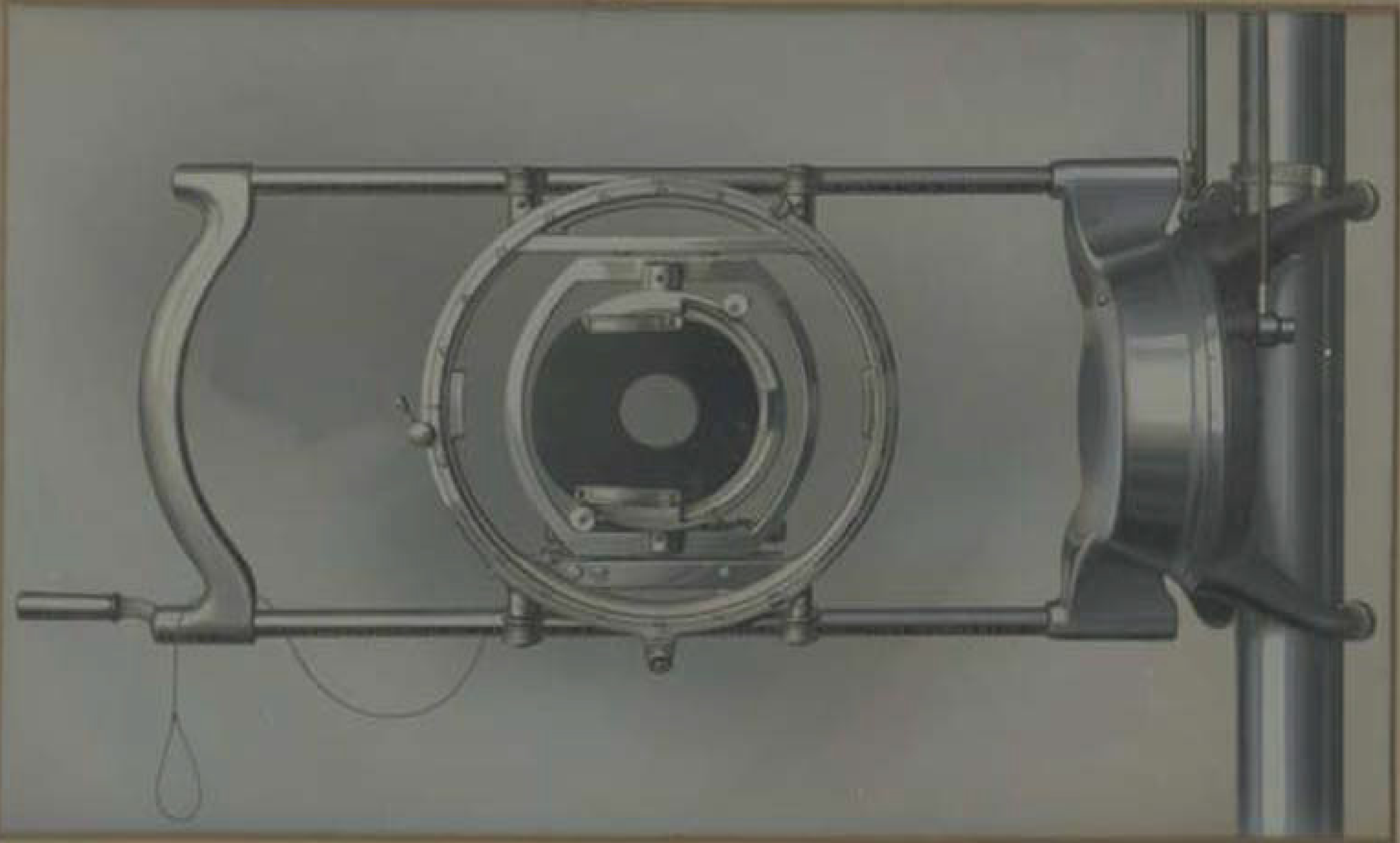
Campbell
Tube Tilt Table



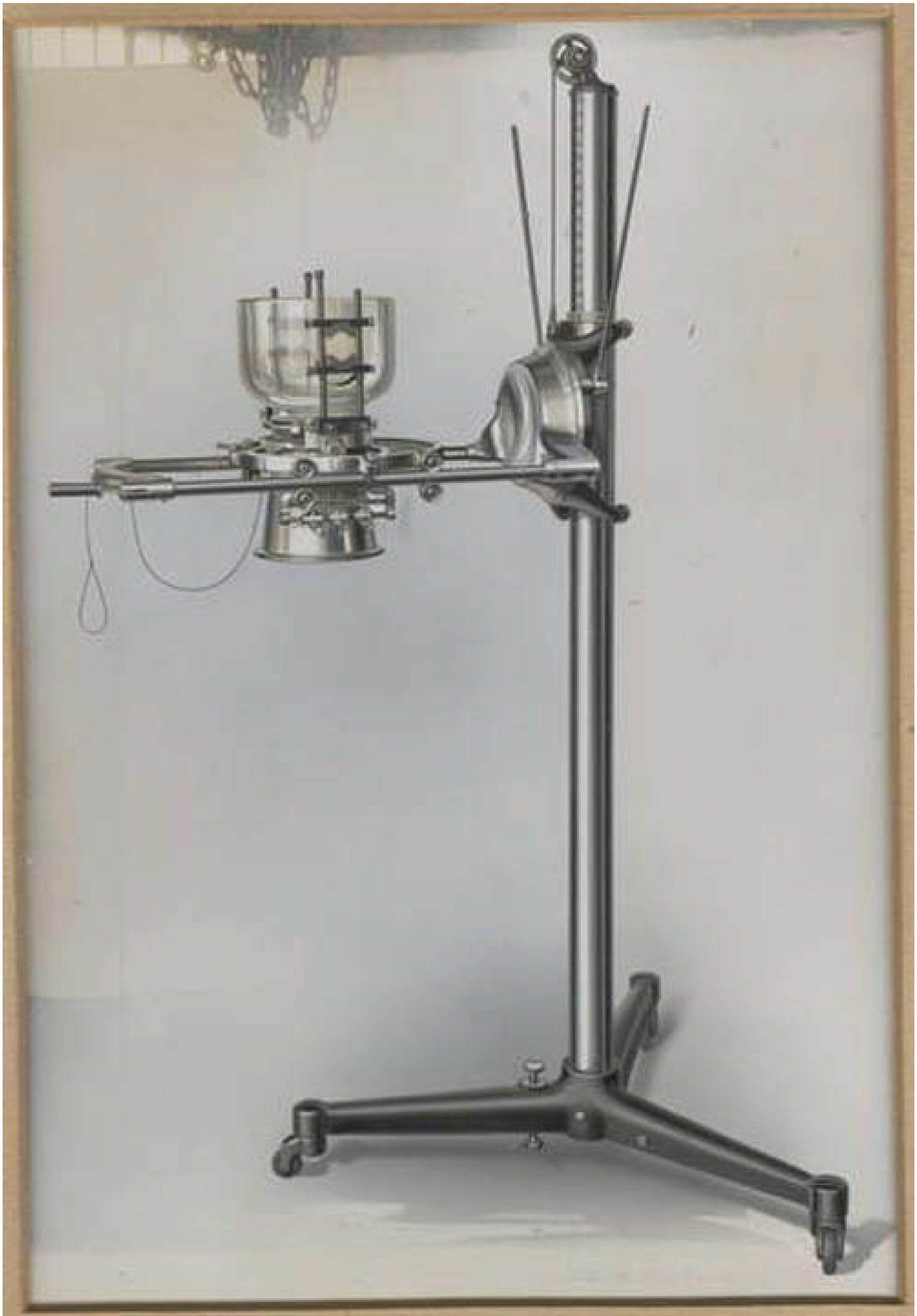


3 [illegible] [illegible] [illegible] [illegible]
Cut out – Eng.

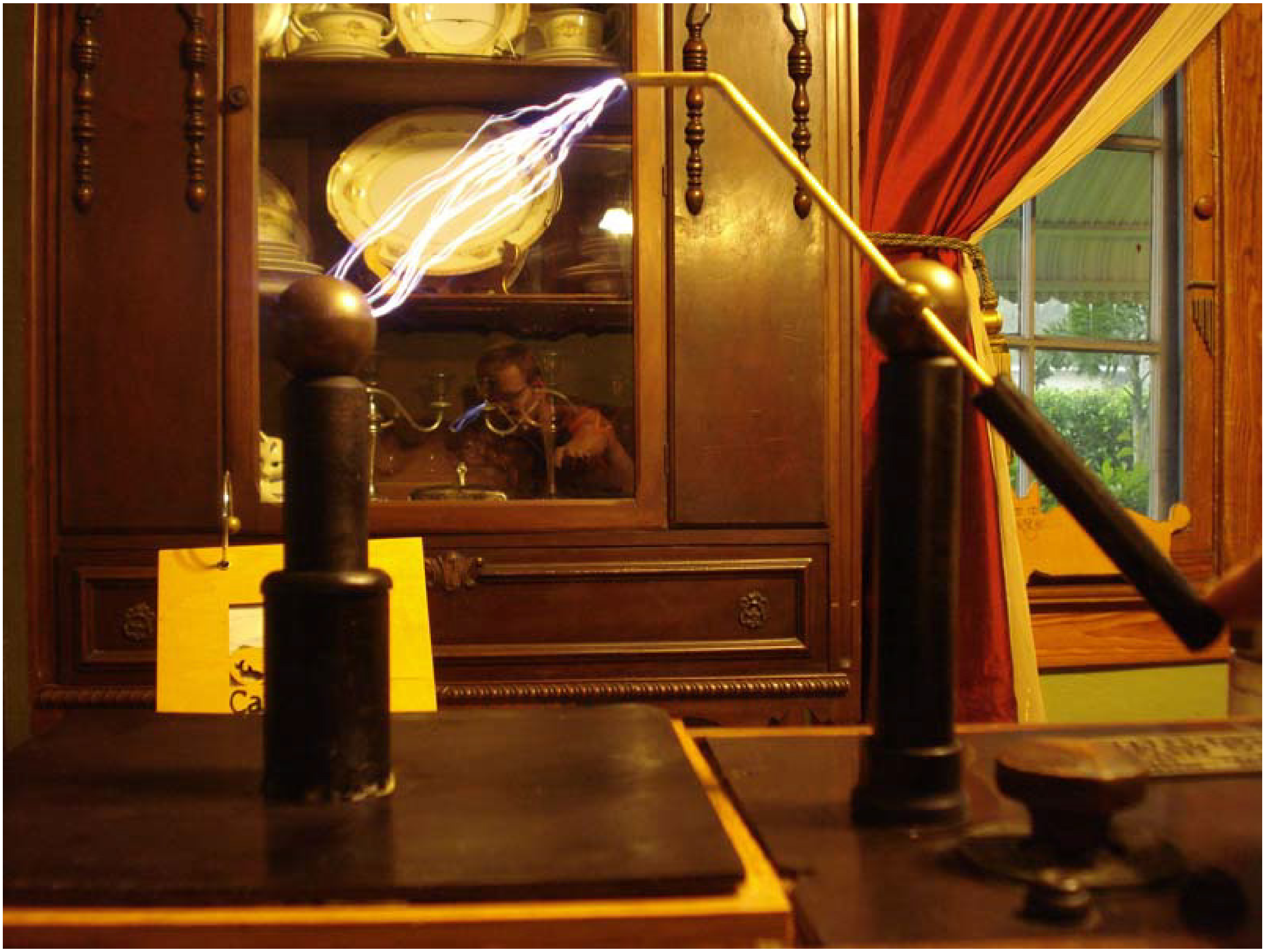
6⅞ [illegible]

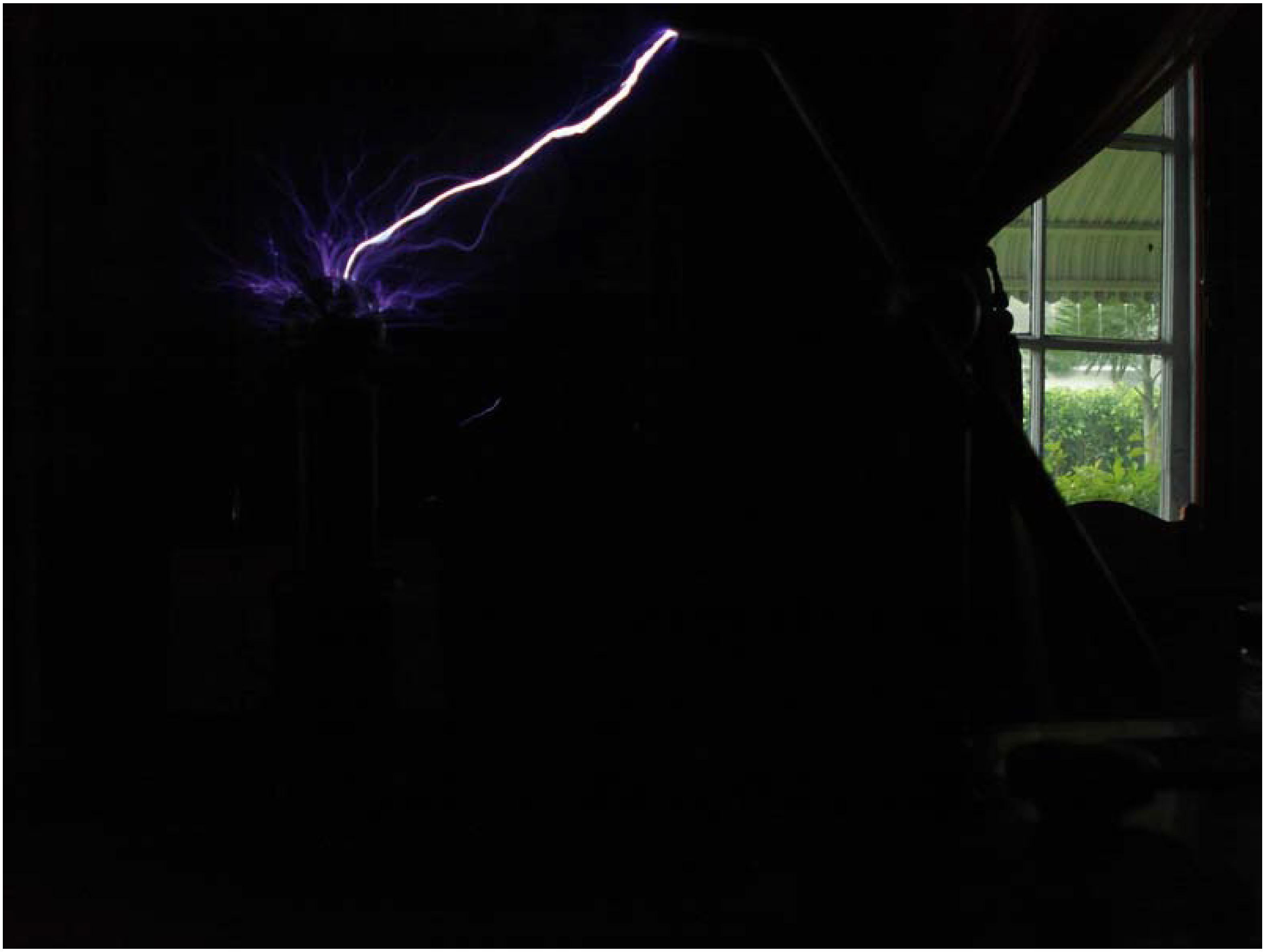


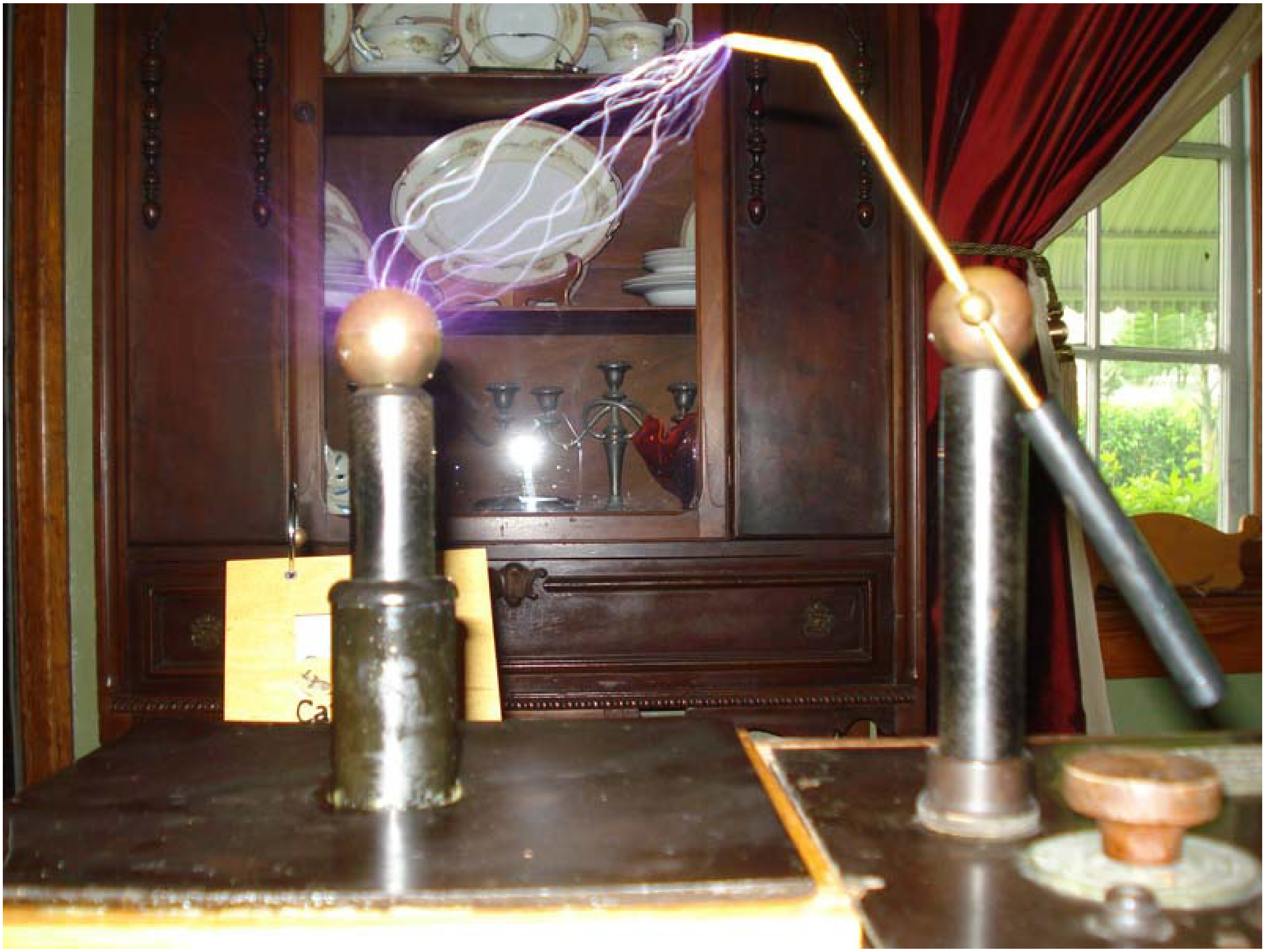
Carriage on
No. 6 Stereoscopic Tube Stand

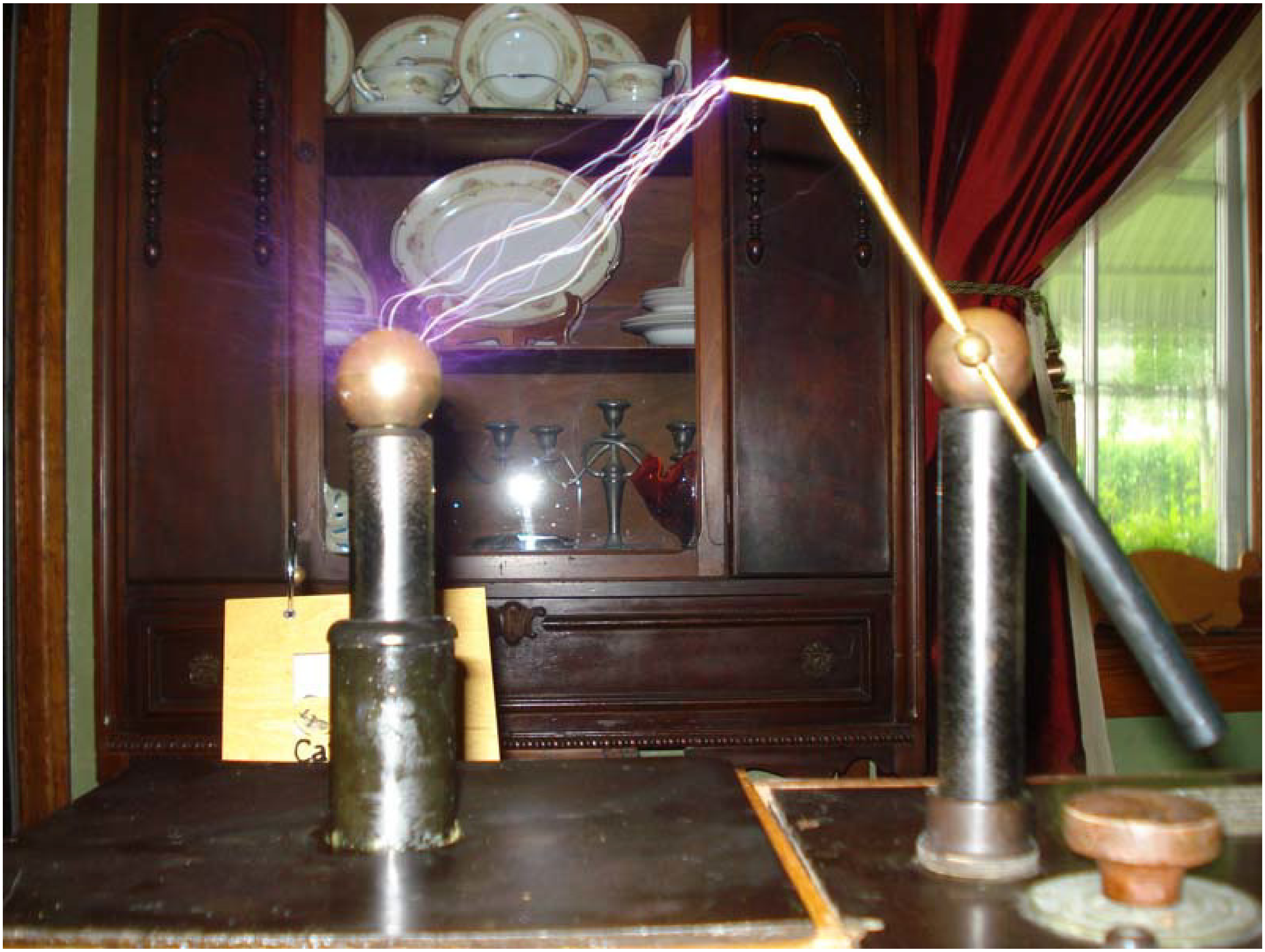


No. 6 Stereoscopic Tube Stand


Ca

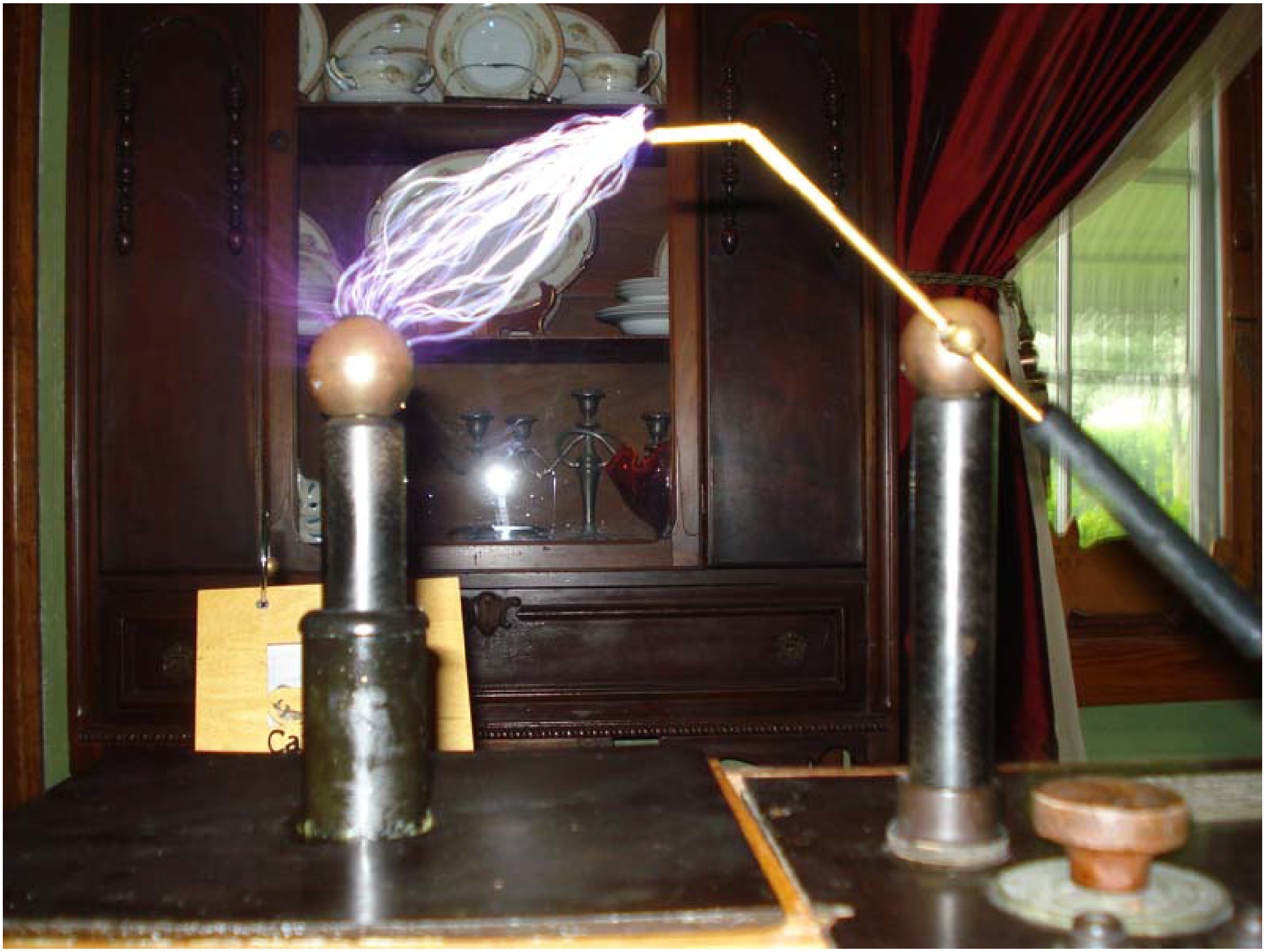




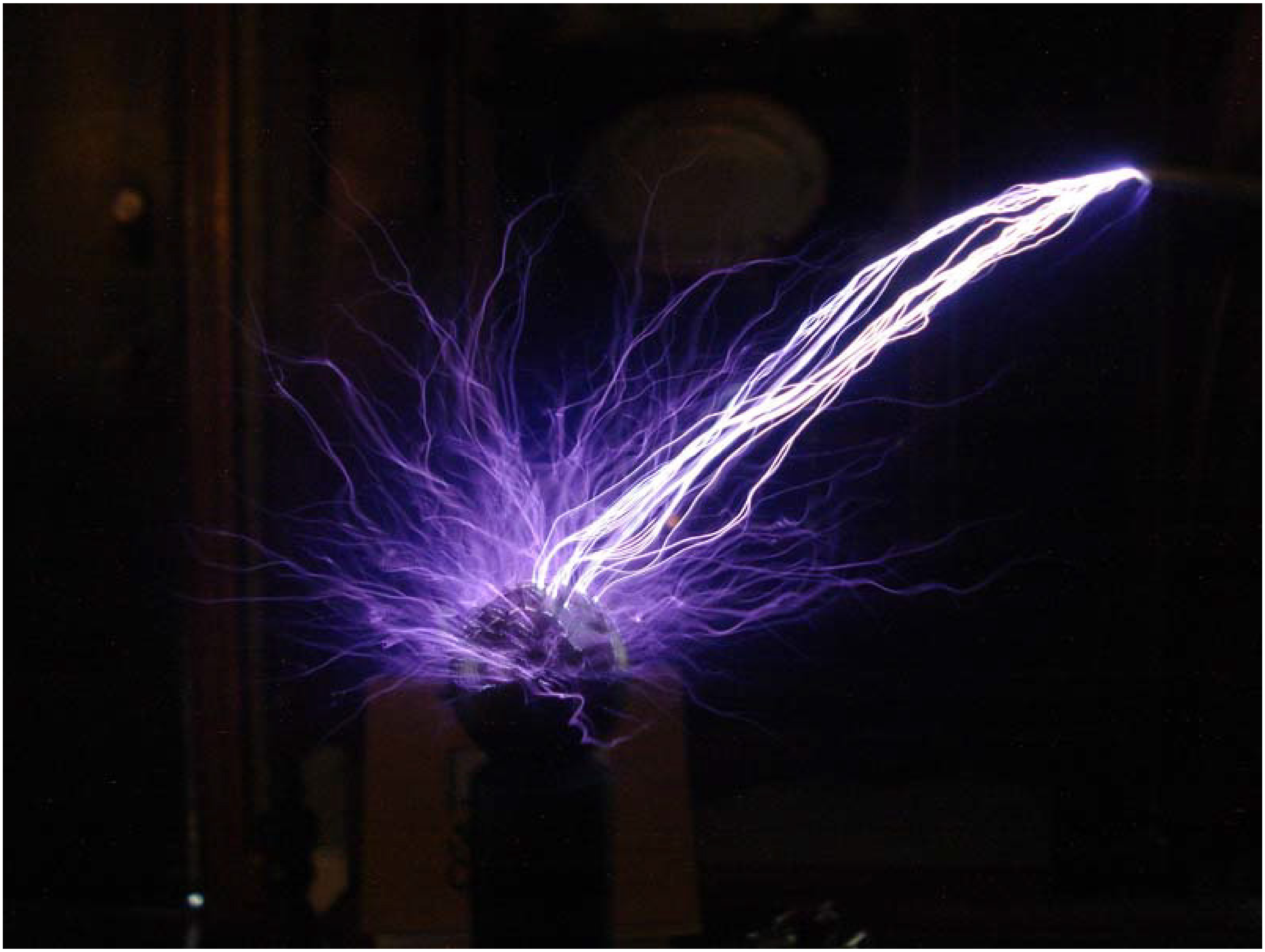


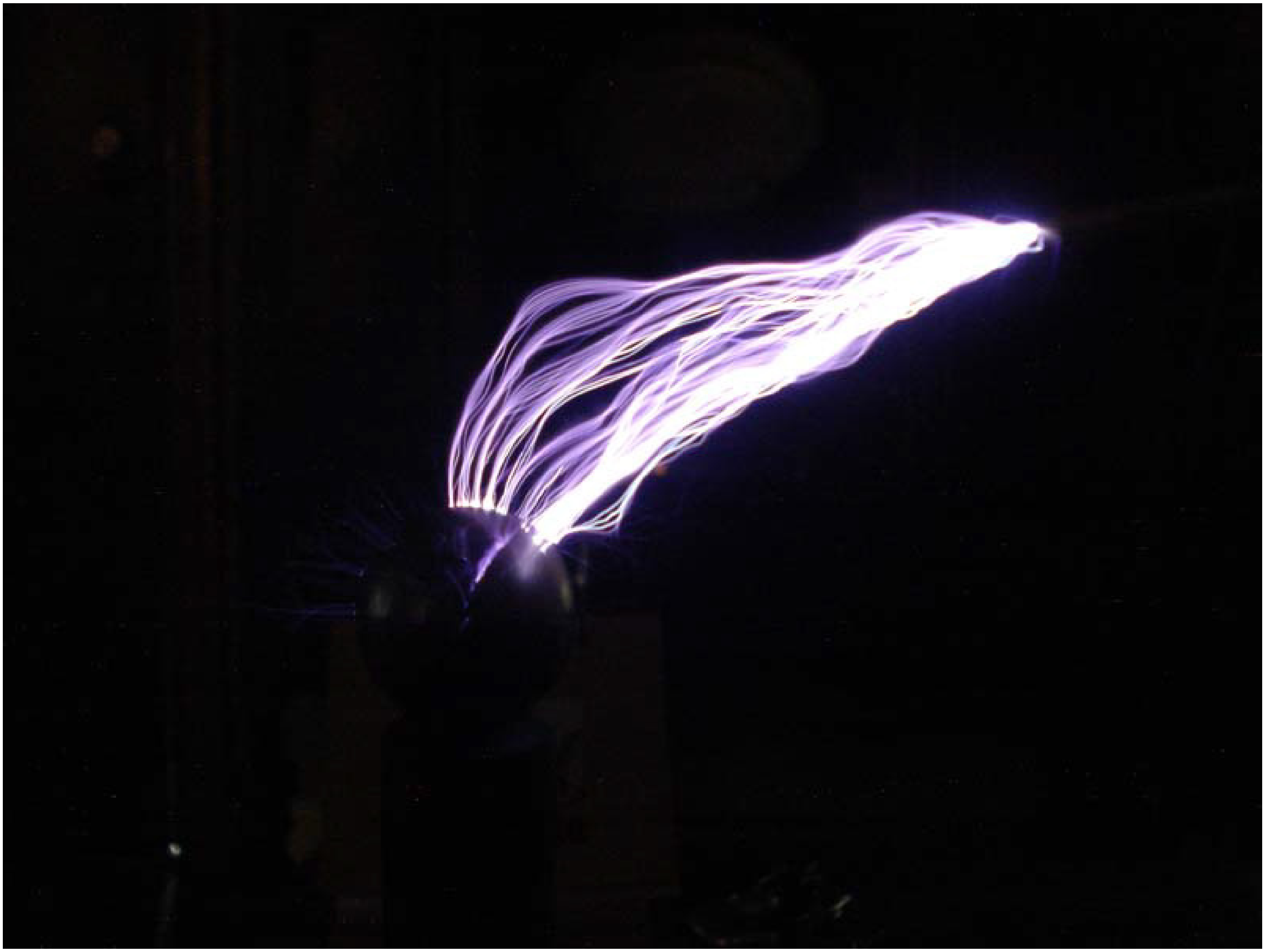
Ca

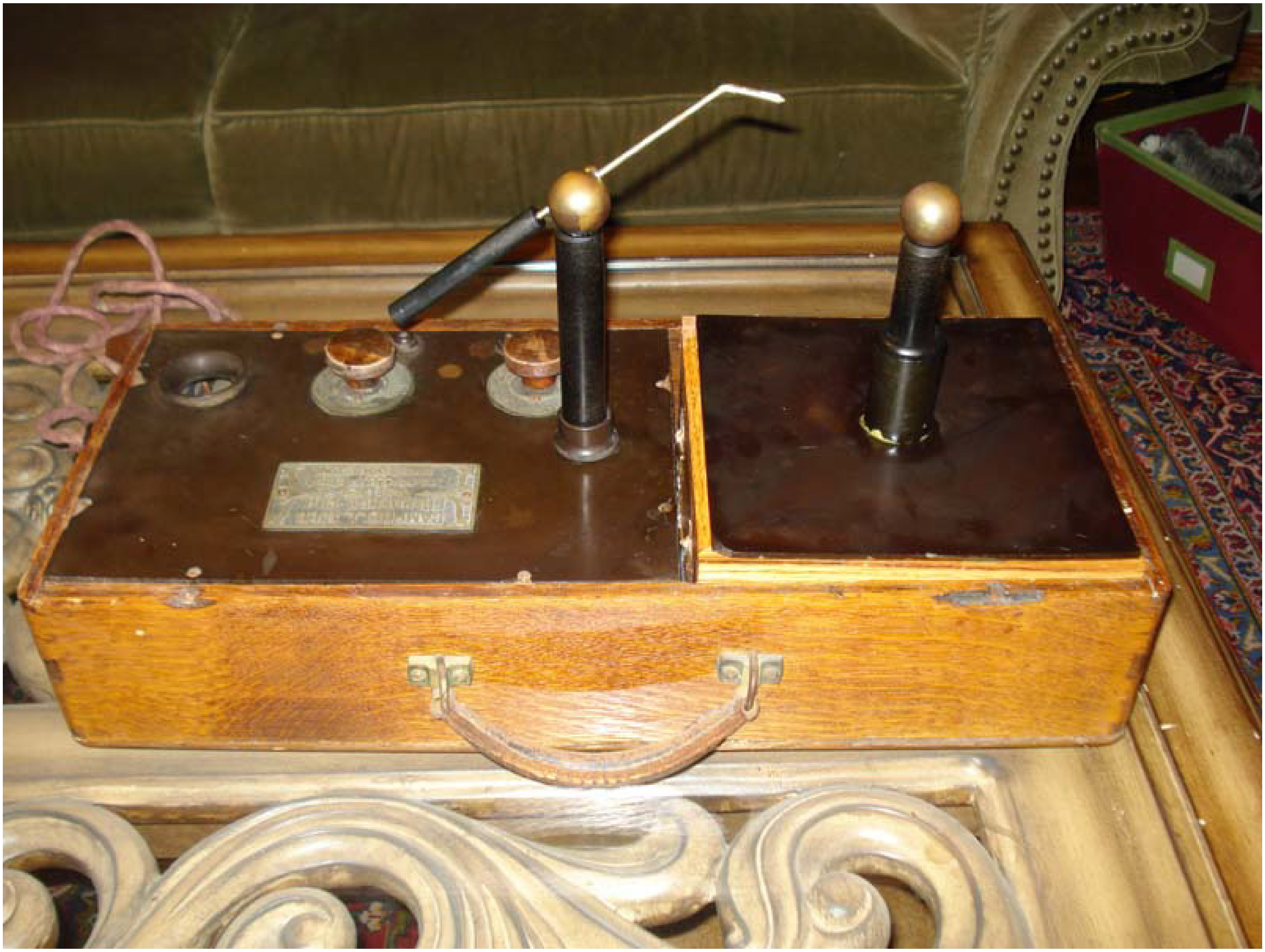
Ca


Ca

Ca







NATURE'S HELPER

One Treatment Will Convince You

Campbell INFRA-RED RAY Lamp

Removes Congestion with Penetrating Rays

WILLIAM
CAMPBELL

Foreword

This little book is dedicated to every person who wishes to be healthy, normal and active.

No matter what your ailment may be, I ask you to read this book slowly, word for word. Read what doctors say. Note the many ailments for which they recommend Infra-Red Ray treatments. Read what the people using my lamp say it has done for them—and their families.

There is every reason for you believing that Infra-Red Ray treatments will bring you relief from pain. . . . . will help you regain health. . . . . and my guarantee printed below protects you in every way. Under this guarantee, you use the Campbell Infra-Red Ray Lamp for 30 days on trial. If it does not satisfy you, send it back and get your money back. But it will help you, I am sure, for so many have secured such wonderful results with Infra-Red Ray treatments—*Sun light is 80% Infra-Red Rays.*

Satisfaction or Your Money Back

William Campbell Company

BOND OF GUARANTEE

OF THE

Campbell
INFRA RED RAY
Lamp

We, The William Campbell Company, Alliance, Ohio, guarantee that Campbell's Infra-Red Ray Lamp will do all that is claimed for it exactly as described and illustrated in this book, if used according to directions.

Each and every Lamp is sold with the positive understanding that if it is not entirely satisfactory we will take it back and return every penny you have paid for it, including transportation charges, inside of thirty days from the time you receive it. This means that if for any reason whatever you are dissatisfied during the thirty days' free trial of the Campbell's Infra-Red Ray Lamp in your home, you may return it to us at our expense and we will refund your money.

This guarantee is a binding, signed agreement, made between The William Campbell Company and every purchaser of the Campbell's Infra-Red Ray Lamp.

Incorporated Under the Laws of the State of Ohio
Capital $100,000.00, Fully Paid
Factories: Alliance, Ohio

(Signed) *WILLIAM CAMPBELL COMPANY*
Alliance, Ohio
WILLIAM CAMPBELL, President

Satisfaction or Your Money Back

Regain Wonderful, Precious Health

Good health: What a blessing it is. Healthy people invariably are happy . . . arising daily in joyous anticipation of the day's adventures. Everyone wants to be healthy, and fortunately, most men and women can be. New medical knowledge has now brought good health within the reach of many people suffering from more or less serious ailments. Like many important discoveries in the art of healing Infra-Red Rays are an extremely simple but highly effective treatment for relieving numerous varieties of human ailments, afflictions and even diseases.

Speedy Relief for Old People

During the past five years particularly the medical profession has devoted considerable attention, privately and in hospitals, to the beneficial results of Infra-Red Ray treatments. Case records show Infra-Red Ray treatments to be efficient in relieving pain, and in many cases effecting complete recovery, in cases where faulty blood circulation is either directly or indirectly the cause of the trouble. Medical science tells us that the majority of body ailments today may be traced directly to this condition which physicians refer to as "internal congestion."

Infra-Red Rays penetrate as deeply as four to six inches into the body, create soothing heat in the tissues which brings relief from congestion, and helps restore normal blood circulation. Nature does the healing. Infra-Red Rays are merely a natural agent for stimulating Nature. Campbell's Infra-Red Ray Lamp is a simple, practical apparatus for generating Infra-Red Rays. It is sold on such easy terms, and the price is so low, that every family can afford it . . . and certainly every home should have it. I ask you to study the information in this book carefully . . . it represents the experience and opinion of many leading physicians as to the healing and curative value of Infra-Red Ray treatments.

William Campbell

President

The William Campbell Co.,
Alliance, Ohio.

WILLIAM
CAMPBELL

Foreword

This little book is dedicated to every person who wishes to be healthy, normal and active.

No matter what your ailment may be, I ask you to read this book slowly, word for word. Read what doctors say. Note the many ailments for which they recommend Infra-Red Ray treatments. Read what the people using my lamp say it has done for them—and their families.

There is every reason for you believing that Infra-Red Ray treatments will bring you relief from pain. . . . . will help you regain health. . . . . and my guarantee printed below protects you in every way. Under this guarantee, you use the Campbell Infra-Red Ray Lamp for 30 days on trial. If it does not satisfy you, send it back and get your money back. But it will help you, I am sure, for so many have secured such wonderful results with Infra-Red Ray treatments—*Sun light is 80% Infra-Red Rays.*

Satisfaction or Your Money Back

William Campbell Company

BOND OF GUARANTEE

OF THE

Campbell
INFRA RED RAY
Lamp

We, The William Campbell Company, Alliance, Ohio, guarantee that Campbell's Infra-Red Ray Lamp will do all that is claimed for it exactly as described and illustrated in this book, if used according to directions.

Each and every Lamp is sold with the positive understanding that if it is not entirely satisfactory we will take it back and return every penny you have paid for it, including transportation charges, inside of thirty days from the time you receive it. This means that if for any reason whatever you are dissatisfied during the thirty days' free trial of the Campbell's Infra-Red Ray Lamp in your home, you may return it to us at our expense and we will refund your money.

This guarantee is a binding, signed agreement, made between The William Campbell Company and every purchaser of the Campbell's Infra-Red Ray Lamp.

Incorporated Under the Laws of the State of Ohio
Capital $100,000.00, Fully Paid
Factories: Alliance, Ohio

(Signed) WILLIAM CAMPBELL COMPANY
Alliance, Ohio
WILLIAM CAMPBELL, President

Satisfaction or Your Money Back

Regain Wonderful, Precious Health

Good health: What a blessing it is. Healthy people invariably are happy . . . arising daily in joyous anticipation of the day's adventures. Everyone wants to be healthy, and fortunately, most men and women can be. New medical knowledge has now brought good health within the reach of many people suffering from more or less serious ailments. Like many important discoveries in the art of healing Infra-Red Rays are an extremely simple but highly effective treatment for relieving numerous varieties of human ailments, afflictions and even diseases.

Speedy Relief for Old People

During the past five years particularly the medical profession has devoted considerable attention, privately and in hospitals, to the beneficial results of Infra-Red Ray treatments. Case records show Infra-Red Ray treatments to be efficient in relieving pain, and in many cases effecting complete recovery, in cases where faulty blood circulation is either directly or indirectly the cause of the trouble. Medical science tells us that the majority of body ailments today may be traced directly to this condition which physicians refer to as "internal congestion."

Infra-Red Rays penetrate as deeply as four to six inches into the body, create soothing heat in the tissues which brings relief from congestion, and helps restore normal blood circulation. Nature does the healing. Infra-Red Rays are merely a natural agent for stimulating Nature. Campbell's Infra-Red Ray Lamp is a simple, practical apparatus for generating Infra-Red Rays. It is sold on such easy terms, and the price is so low, that every family can afford it . . . and certainly every home should have it. I ask you to study the information in this book carefully . . . it represents the experience and opinion of many leading physicians as to the healing and curative value of Infra-Red Ray treatments.

William Campbell

President

THE WILLIAM CAMPBELL CO.,
Alliance, Ohio.

What Are Infra-Red Rays?

Sunlight is recognized as the greatest healing or therapeutic agent known to man. 80% of sunlight is Infra-Red Rays—the rays which produce all the heat of the universe. When produced artificially they are the rays given off from any dark, metallic substance that is heated to a deep, cherry red. These rays are the mild, soothing, beneficial rays of high healing value that may be used with perfect safety by any person. Dr. T. Howard Plank, the noted physician and leading medical authority says: "These rays (Infra-Red Rays) are safe for both external and cavity use."

How the Rays Do the Healing

Infra-Red Rays are invisible. They penetrate as deeply as four to six inches into the tissues of the body, and the resistance of the tissues to the rays is the action that produces the healing heat. The heat thus created so deeply beneath the outer skin of the body, softens the veins and capillaries and relieves congestion in the body. Active blood circulation then carries the poisons, which are the root of your ailment, away.

The importance of Infra-Red Rays from a medical standpoint lies in the fact that these rays penetrate deeply into the human tissue and the internal heat created in the body restores active blood circulation—Nature does the rest. Where every part of the system is receiving a proper blood supply, disease, or ailments cannot linger.

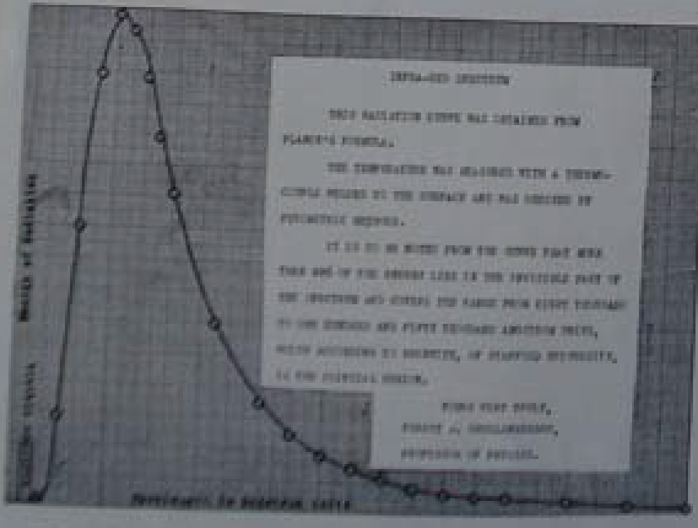
Infra-Red Rays, as stated above, are invisible. Let me explain this first by quoting from Dr. Plank's book, where he states: "Sunlight gives approximately 80% Infra Red Rays, 13% visible rays and 7% ultra-violet rays on clear bright summer days."

Sun rays may be divided into three classes:

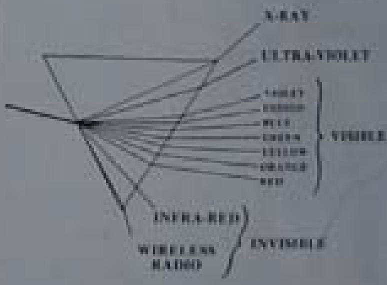
No. 1—The visible rays are the red, orange, yellow, green, blue, indigo and violet rays.

No. 2—Those *above* the visible rays include the Ultra-Violet Ray and the X-Ray.

No. 3—Those *below* the visible rays are the Infra-Red Rays and the Wireless Radio Rays, and as you know the Wireless Radio Rays carry their energy through everything.



The above shows a diagram that was made in the Mount Union College Laboratory by Forest J. Shollenberger, Professor of Physics. Professor Shollenberger tested the Campbell Infra-Red Ray Lamp unit to determine the value or length of the Infra-Red Ray. You will note from the diagram that the energy of radiation or carrying power of the rays are 99% in the invisible or clinical region.



This shows a diagram of how the spectrum may be divided. Sunlight contains all of the rays of the spectrum. If one could direct sunlight through the prism glass as indicated here, the different rays could be separated by refraction and exhibited on the screen. You will note that the higher or top rays are the X-Rays, then the Ultra Violet and below that the Visible Color Rays. Below the Visible Color Rays we find the Infra-Red and the wireless radio rays.

Infra-Red Ray Treatments Used for Years in Hospitals

There is nothing new in the practice of medicine regarding curative value of Infra-Red Ray treatments. It is as old as civilization itself. Dr. T. Howard Plank sums up very briefly—the use of Infra-Red Ray treatments by the medical profession:

"In 1301 John of Gaddesden treated the son of King Edward I for smallpox, using the infra-red rays in as many ways as he could develop with his meager knowledge. The results in this case were successful.

"Gregory revived infra-red healing in 1843. It was again brought to the attention of the profession in 1867 and 1871, but did not gain a foothold until Finsen used it in 1893, to be followed by Reed, Surgeon in the Royal Navy in 1897.

"Yet it is only within the past few years that we have been able to use these rays knowingly for healing purposes, although we have always used them from the sun which gives 80% infra-red rays."

* * *

Every mother knows that babies thrive better under the stimulus of outdoor sunshine. Most people know that hospital patients, convalescing from sickness, are wheeled outdoors into the sunshine whenever possible. Health is safeguarded and recovery more certain when people have the benefit of outdoor sunshine. Remember, sunshine is 80% Infra-Red Rays.

What many people do not know, however, is the fact that the foremost members of the medical profession have used Infra-Red Ray treatments . . . produced by the same scientific principles as employed in Campbell's Infra-Red Lamp . . . for many years in treating their patients.

Control and application of the Infra-Red Rays is the principle worked out in the Campbell Infra-Red Ray Lamp. It is the simple, easy to operate, easy to handle, easy to control, easy to use, perfectly safe method of applying Infra-Red Rays to the body.

Most hospitals have had apparatus for generating Infra-Red Rays for a good many years, but as Dr. Frank Thomas Woodbury, B. A., M. D., states in the January issue of the Medical Review of Reviews, it is not necessary to have an expensive apparatus costing Six Hundred Dollars in order to generate Infra-Red Rays.

The only "new" thing about Infra-Red Ray treatments is the fact that they are now available to every person in the home by means of Campbell's Infra-Red Ray Lamp; and Dr. Plank has this to say on page 100 of his famous book: "The short, intensive treatments may be given in an office, but the prolonged, mild treatments are for use in the home . . ." etc.

* * *

Campbell's Infra-Red Ray Lamp has now made it possible and practical from a standpoint of cost for you to enjoy the benefits of Infra-Red Ray treatments in your home. In using this healing and curative force for home treatment of your ailments, you are using the same exact agency for which wealthy people have paid big fees to doctors and hospitals—in the past.

Campbell's Lamp Has Made It Possible for Every Home to Have the Benefit of These Healing Treatments

Colds: For colds that settles in the chest or bronchial tubes, the use of the Infra-Red Ray Lamp is simply wonderful.

Headaches: For driving away headaches, there just isn't any better method of treatment.

Rheumatism: The very first application of Infra-Red Rays will bring relief.

Neuritis: The results will simply be astonishing. One or two treatments is all that is necessary.

Sinus Trouble: Infra-Red Rays have no difficulty in penetrating to the seat of the trouble, restoring an active circulation of blood which will bring relief.

Croup: Here is where the use of the Infra-Red Ray Lamp is a blessing indeed, as it will quickly relieve these dangerous troubles.

Stop Ear Troubles at Once: Isn't this one of the most pitiful troubles for a child to have? Nothing will relieve it like the soothing rays of an Infra-Red Ray Lamp.

Lumbago: Two or three treatments is all that is necessary to relieve a serious case of lumbago.

Catarrh and Catarrhal Deafness: The Infra-Red Ray Lamp is simply marvelous and in a great many cases has restored good hearing for those who have been practically deaf.

Baldness: It will create an active blood circulation in the hair falicales and will do more to restore hair than any other method known.

It is beneficial wherever a renewed circulation of fresh blood would be beneficial.

Thirty Days' Trial in Your Own Home

When sending your order for the Campbell's Infra-Red Ray Lamp. Remember, that it is shipped on the distinct understanding that if you are not satisfied, after using it thirty days, you may return it . . . and every cent paid to us, plus transportation charges, will be refunded.

Let me send you a Campbell Infra-Red Ray Lamp on approval. Use it 30 days. Test it in every way that you have occasion to use it. If someone is suffering in your home right now, make this a test case to convince you that the Campbell Infra-Red Ray Lamp will bring relief. Just a trial is all that is needed and when one makes a fair and square trial with a Campbell Infra-Red Ray Lamp as directed, results are invariably certain.

William Campbell Company,
Alliance, Ohio.

Gentlemen: I began using your Infra-Red Ray Lamp the 22nd of May and in these few weeks, it has worked wonders for me.

For five years I treated with specialists, tried a change of climate, Ultra-Violet rays and Sanatoriums, but gained no relief. My chronic bronchitis was several times diagnosed as Tuberculosis. I was told my condition was incurable and that I must be resigned to be an invalid the rest of my life.

I received the Infra-Red Ray Lamp, and in these few weeks my cough has entirely ceased, the steady flow of yellow sputum has stopped, my nerves are almost normal, my appetite is natural. My friends are astonished at the change in my appearance. I want to pass the source of my recovery on to others.

Gratefully yours,
Alice M. Brown

3409 42 Street,
Sacramento, Calif.,
June 13, 1927.

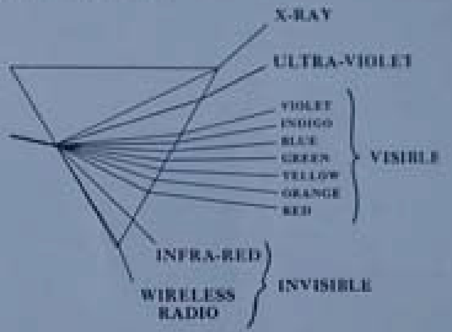
Television Experiments Prove Infra-Red Rays Harmless

Experiments made by radio experts with the new "television" have proved that only Infra-Red Ray Light is practical and safe to use. The newest discoveries prove that, while Red Light has a penetrating power sixteen times more effective than Blue, the Infra-Red Rays penetrate from two hundred to three hundred times more effectively.

Other experiments in "television" demonstrate that whereas the "Ultra-Violet Ray was far too dangerous to use, having a bad effect on the eyes," the Infra-Red Rays were safe . . . "the light-sensitive cell responding well to the rays which are invisible to the human eye."

These experiments in "television" surely prove conclusively that if the human eye can bear the light of these rays, certainly their penetrative influence cannot harm the most delicate, sensitive skin.

The chart on this page shows clearly the position in the spectrum of the medical rays that do burn, the X-Ray and the Ultra-Violet Ray, and the Infra-Red Ray which does not burn. The burning rays are at the top of the spectrum. The harmless rays (the Infra-Red Ray and the Wireless Radio Ray) are at the bottom of the spectrum. Campbell's Infra-Red Ray Lamp generates ONLY the Infra-Red, or harmless ray. This ray, as shown by the experiments in "television" and by statements of Dr. Rice, a leading medical authority, will never burn, irritate or blister the skin . . . for there is no heat, itself, in the ray. The Infra-Red Ray is simply an electro-magnetic wave of the ether which, when penetrating the tissues, produces heat deep inside the body.



This shows a diagram of how the spectrum may be divided. Sunlight contains all of the rays of the spectrum. If one could direct sunlight through the prism glass as indicated here, the different rays could be separated by refraction and exhibited on the screen. You will note that the higher or top rays are the X-Rays, then the Ultra Violet and below that the Visible Color Rays. Below the Visible Color Rays we find the Infra-Red and the wireless radio rays.

Elderly People and Children Can't Always Visit the Doctor

Many men and women advanced in years are so situated that it is not convenient for them to visit their family physician. On account of this fact, many of them put up with pain that frequently is severe . . . . pain that would be easily relieved with Infra-Red Ray treatments. People who live on a farm don't feel like driving to town after a hard day's labor, either—and particularly in their case is a Campbell's Infra-Red Ray Lamp an indispensable necessity. Especially where there are children. A good many people know that they should visit their doctor more often, but just naturally haven't the time to do so. These people will find the Campbell Infra-Red Ray Lamp a wonderful aid to good health . . . . . for they can take treatments at any hour of the day or night—in their spare time.

Why Infra-Red Ray Heat Differs from That of Salt or Sand Bags, Electric Pads, Etc.

With an Infra-Red Ray Lamp the heat is passed right through the skin and penetrates away down into the seat of the trouble immediately. Furthermore, it concentrates the heat only onto or into the affected area. The Infra-Red Ray heat is always the same. Steady, always at the same degree of temperature—and this is the big secret of healing with heat.

With the heat producing rays generated by Campbell's Infra-Red Ray Lamp, we find many of these rays penetrating inwardly into the body as deeply as four to six inches. Think of it! Their heat is not given up until they come to the end of their journey, deeply imbedded in the tissues of the body. It will readily be seen from this that the nervous system does not have an opportunity to scatter this heat BECAUSE THE HEAT IS NOT PRESENT UNTIL IT HAS PASSED THIS SYSTEM.

In this way, Campbell's Infra-Red Ray Lamp causes a relief of congestion that is entirely beyond the reach of ordinary heat-producing devices.

Rests Eyes

C. L. Lyon, St. Petersburg, Fla., writes: "The lamp is good for eye fatigue or strain. I open them wide and stare into the lamp until it is cool, with my head close up after shutting it off at the end of other treatments. They fill with liquid and it rests them and seems to strengthen them."

Mrs. M. S. Fonda, Canajoharie, N. Y., wrote: "A friend suffering with rheumatism in her knee, came to our home a short time ago and we had her use the Campbell Lamp. She was quite relieved and was able to walk off easily when she went home." Wouldn't you say that was wonderful, too?

Wonderful for Lumbago

Does It, or Can It Burn? You Ask

Infra-Red Rays will not burn, sunburn or cause blisters. The only way you will ever be burned with Campbell's Infra-Red Lamp is by touching your finger to the electric element generating the Infra-Red Rays. There is no other way it can burn you, cause sunburn or blister . . . so long as you keep the edge of the cone receptacle approximately twelve inches from the body. The President of the Starck Electric Railway, Alliance, Ohio (Mr. Davis), wrote: "I find that it is perfectly safe, as on a number of occasions I have fallen asleep from its soothing effects and I find that it does not burn or cause any adverse reaction."

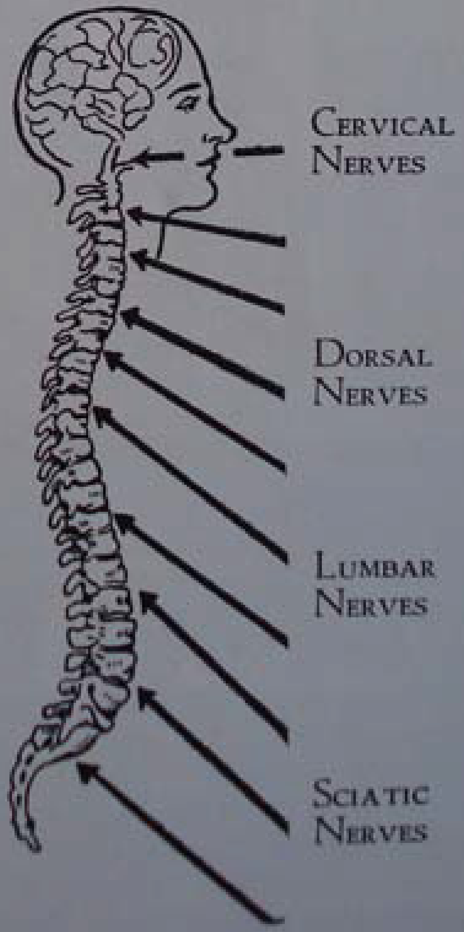
The Cause of Most Human Ailments—Spinal Congestion

Practically every function of the body is controlled from the spinal column. The spinal column is made up of a series of vertebrae and cartilage and is held together by muscle and ligaments. From the brain to the base of the spine there is a canal which encloses the spinal cord and it is along this trunk line of the nervous system that all sensations are transferred from the brain to the various parts of the human body. Between each vertebrae there is a "hole"—which is known as the spinal window—and through this hole on either side of the spine emanate the nerve and arteries running to the various units. These nerves control the functions of various parts and when the nerve is affected you will readily see that the part of the body controlled by this nerve is also affected. You will also understand why there can be little wrong with any part of the human body if the spinal cord and its various branches are in perfect condition.

Here is what happens, therefore, when you are ailing:

If the muscles holding the spinal column together contract (close up) from any cause whatever they immediately cause a congestion or an obstruction to the free flow of blood in and out of the spinal column. Also, pressure is exerted against the nerves radiating from the spinal column. Another harmful effect is that the segments of the spine are moved out of position. When the spinal segments are thus tipped to one side, the spinal window from which come the nerves and blood vessels is considerably closed—causing an irritation of the nerve that results in pain at its extremities (foot, hand, elbow, knee, etc.)

Stagnant tissues are fertile breeding ground for disease germs, and if you are to enjoy good health you must keep the area along the spinal column free from obstruction. Infra-Red Ray Internal Heat does this.



Spinal Column's Four Nerve Centers

The Cervical nerves control the head, neck, shoulders and arms.

The Dorsal nerves control the chest and lung area.

The Lumbar nerves control the stomach, liver, kidneys and gall-bladder.

The Sciatic nerves control the lower part of the abdomen and also the nerves of the legs and feet.

Locating Congestion in the Spine

From the foregoing it is evident that the root of many ailments lies in one of the four nerve centers of the spine—that the breaking up of congestion existing in these nerve centers would automatically bring relief to the parts of the body controlled by these nerve centers.

Location of these congestions is easily accomplished with the fingers. Simply start at the base of the skull, and proceed downward on both sides of the spine . . . pressing the muscles. If the flesh seems abnormally solid and there is pain, it is a good indication of congestion.

Infra-Red Ray Internal Heat applied to the area relieves congestion and stops pain, and application of the Infra-Red Ray to certain other parts of the body for various ailments (as specified in the treatment of specific diseases or troubles herein) invariably brings relief.

Benefits Obtained in Rheumatic Cases

Infra-Red Ray treatment is beneficial in relieving rheumatism, as will be noted in reading the letters quoted from patients who bought Campbell's Infra-Red Ray Lamp for this purpose.

Inflammatory Rheumatism Relieved

Mrs. Marvin S. Fonda, 89 Reed St., Canajoharie, N. Y., wrote us a letter from which the following is taken:

"My case of inflammatory rheumatism has troubled me for two and a half years. Two doctors and several remedies failed to help me. Chiropractic treatments helped . . . but I had to keep on taking them at least two or three times a week. After using the Campbell's Infra-Red Ray Lamp for an hour every day for a week, I began to gradually stop the adjustments, and I have gone for more than two weeks without an adjustment. I have not lost any sleep for aches or pains. The lamp relieves just as much as the adjustments and is much cheaper."

Mrs. C. B. Rice, Route 1, Box 283, Rivera, California, says:

"I have had the Infra-Red Ray Lamp less than two weeks, but from what I have experienced and what I see possible, I am going to write. I have suffered from rheumatism and neuritis combined and I am in a run-down condition with unequal circulation and nervous indigestion from which I have suffered many years. I am now sixty-eight and of course am more difficult to benefit than one younger would be. When my head is hot and my feet are cold, a treatment on the feet and the knees, then at the base of the spine produces a copious sweat and wonderful relief."

Sciatic Rheumatism Cured, Husband Believes

Mr. Albert E. Holderman, Reedley, California, wrote: "I purchased the Campbell Infra-Red Ray Lamp from you for the special benefit of my wife, who has been afflicted with Sciatic Rheumatism for several years, having recurred about every six months for about five or six years. We tried everything we could use, hot packs, liniments, tablets, etc., and then this wonderful lamp came. My wife slept fine after the half hour treatment and the next evening the treatment was repeated. The swelling commenced to leave after the first treatment and the third day the size of the knee was normal . . . with very little pain or soreness. About three days later the third treatment was given. She has had no pain or trouble since, after a lapse of about a month. We think she is cured."

Rheumatism in Foot Gone

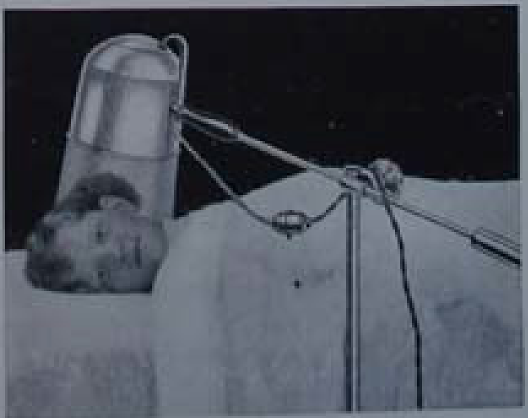
Mrs. A. G. Washburn, 122 Fort Hill St., Macon, Ga., wrote: "I have rheumatism in my feet and ankles. They were swollen and so sore I could hardly walk. Since using your lamp the soreness and swelling has gone. The first time I used it about 30 minutes and it didn't seem to do much good, so I began to use it an hour each night and morning. *In two or three days I felt like I had new feet.*"

Two Treatments Fixed Up Old Lady

Mrs. C. A. Crittenden, Conneaut, Ohio, writes: "I have used a Campbell Infra-Red Ray Lamp for general relief and for some special cases. I have found it helpful for a nervous old lady with a lot of pain under her shoulder blades. Two treatments disposed of the pain, *which has not returned*, and she rests better at nights."

Mrs. George Cramer, Niles, Ohio, says: "I have been suffering from that dreaded disease rheumatism and have been greatly benefited by the use of your Lamp. About March, my foot gave me considerable trouble—greatly swollen and exceedingly painful. Through my niece, who was in your employ, I was induced to try your Lamp. I received it about a month ago, used it religiously, now the swelling and pain are all gone. The soreness and lameness are out of my joints and my circulation is also better. I feel like a new person. My daughter has neuritis and gets almost instant relief. My little grandson had a cold. Just two applications was necessary for a complete recovery. It is certainly indispensable in every home."

Mrs. Ida Higginbothem, 1563 Broadway, Schenectady, New York, wrote us a letter from which the following is taken: "Please find enclosed money order for the Infra-Red Ray Lamp, which I am very glad to say is money well spent. It is a wonderful thing to have in any home. It has helped my husband's rheumatism wonderfully as he has been a very sick man, but thank God he has gone back to work last Tuesday, the first time since last March."



Stop Ear Trouble At Once

Treating Bronchitis, Bronchial Troubles, Colds, Etc.

In the treatment of these ailments with Infra-Red Rays, the Rays should first be directed to the location, then to the areas marked One, Five and Seven as indicated on the charts of the human body shown on page 18.

Child Coaxes for Treatments

Mrs. W. A. Vasey, General Delivery, Glendale, California, stated the following in a letter to us:

"My little girl, seven years old, is subject to bronchitis and the day the Campbell Infra-Red Ray Lamp came she was in bed sick. Had been there a week with all the symptoms of measles, but they had not broken out on her. I had given her several hot baths. Her throat was terrible, so I put the lamp on her throat and chest, then on her back between the shoulders, and in an hour the measles were out on her to perfection and the next day I did it again and her throat was entirely better. She enjoyed having it used on her; now she coaxes for a treatment every day."

Baby Treated With Good Results

Quoting from Mrs. C. A. Crittenden's letter, R. D. No. 1, Box 20, Conneaut, Ohio:

"I used the Campbell Infra-Red Ray Lamp for a little three-year-old baby when she had a cold with an obstinate cough at night, with very good results."

(Right here I would like to say that the Infra-Red Ray Lamp is worth its weight in gold where there are children in the home. We raised a family of six ourselves, and as I look back upon their babyhood, we would have given anything for one of these lamps in those days. I am sure every mother and father will feel the same way once they know how Infra-Red Ray treatments benefit and relieve so many ailments of children.)

Better Than Medicine for Cough Troubles

Mrs. C. K. Robb, 120 East Sweet Brias Road, Wildwood Crest, N. J., wrote us the following (by the way, she was married just a few days before writing this letter, and Mr. Robb is certainly to be congratulated upon marrying such a sensible little woman): "I had a bad cough and was taking osteopathy for the same, but could not get rid of the cough as it would come on by spells, *but now I am free of it.* I would not want to be without my Campbell Infra-Red Ray Lamp, for I feel that if it is used in time it will do better work than medicine."

Relative Paid $5.00 for Same Treatment

Mrs. M. F. DeMain, 528 Cook St., Lake Geneva, Wisconsin, wrote: "A short time ago my sister's son and wife from New York City were here. The wife has had treatments for neuritis and while here I gave her a treatment which she said did her as much good as what she pays $5.00 for in the city." Just think of it—Five Dollars for a single treatment. Then think of how little the Campbell Infra-Red Ray Lamp costs!

Excellent Results Secured in Neuritis

"I want to say that the Campbell Infra-Red Ray Lamp has cured me of neuritis in the hip," writes Mrs. W. H. Carleton, Cooperstown, N. D. "I had it for over a year, had taken osteopathic treatments, but failed to get relief."

Ended Four Months' Suffering

Here is a case that shows how Campbell's Infra-Red Ray Lamp actually pays for itself many times over, through the savings in medical attention made possible, as well as savings for patent medicines, et cetera. But let Mrs. Dorothy Bartholomew, Batry, Illinois, tell her own story:

"Now I will tell you what Mr. Bartholomew, as well as myself, think of our little doctor" (she means by "doctor" the Campbell's Infra-Red Ray Lamp), "so simple yet so wonderful in results. Mr. Bartholomew has been suffering with neuritis in his right arm for over four months, and I don't believe there has been anything left that he hasn't tried to get relief. As soon as the lamp arrived, I started treating him. I first stripped him to the waist line and started massaging the spine. This I did firmly for fifteen minutes, then I applied the lamp until he was dripping wet with sweat. Then I discontinued the lamp, sponged him thoroughly and applied rubbing alcohol to close the pores, after which he would sleep for an hour, sometimes longer. His pain is entirely gone (note, this was after several treatments) and he is feeling better than he has felt in months. You surely have invented a wonderful light and no home should be without one, for it is a doctor one can call on any time in the day or night and get relief." *Mrs. Bartholomew stated in her letter that in two days her husband had spent $32.00 with a doctor—trying to get relief. Think of it! More than the low price of the lamp* AND NO RELIEF. *More than this, though, if they had had the lamp first they not only would have saved money, but in addition to being relieved they would have had the use of the Campbell Infra-Red Ray Lamp for years afterwards. Of course, they have the lamp now, but it does seem a pity in these days of high prices that they had to waste that $32.00.*

Commonplace Ailments Frequently Become Serious

I wonder if you realize why physicians, public health authorities and insurance companies publish so many articles urging people to "take medical care of the common cold." More often than possibly you know, these common colds develop into catarrh, bronchitis, influenza and sinus infection, pneumonia that in most cases would have been prevented had the person taken prompt care of his, or her, cold with Infra-Red Ray treatments. The cost of medical attention in a pneumonia case would pay the price of the Campbell lamp several times over, to say nothing of the suffering that would have been avoided.

Aged Woman Relieved of Neuralgia

One of the most unusual instances of the healing benefits of Infra-Red Ray treatments is the case of a fine old lady, eighty-two years old, whose son is a practicing physician.

For the past four years this mother suffered from severe neuralgia pains between her shoulders, under her arms and parts of her chest. Her son, the physician, was unable to do much for her. He called in several other doctors, but they failed to help her much. Chiropractic and osteopathic treatments were taken without obtaining relief. Finally, someone told her of Infra-Red Ray treatments and she started using the Campbell Infra-Red Ray Lamp.

Her son, of course, knew that Infra-Red Ray treatments were being given by many members of his profession, and was hopeful that they would help his mother. The first treatment was 45 minutes only. It helped. Two days later another treatment was given. Her pains were less severe, and had localized over a small area under her shoulders and left arm. The next treatment of 30 minutes caused these symptoms to vanish.

She has, of course, implicit faith in the therapeutic value of Infra-Red Ray treatments as a result of her truly wonderful experience. Her son, the physician, is happy that his mother obtained relief; and it is only because of his prominence in the medical profession that the name, in this one instance, is not given. The name will be furnished upon request, however, to any person.

Mr. John Farmer, Oxford St., Alliance, Ohio, says: "I received the Red Ray Lamp a short time ago, and think it wonderful. My wife has had pains in her shoulders and arms for a long time, and could hardly raise her arm up to her head. The Lamp has completely fixed it and she is just about as good as ever. Then, a few nights ago our little girl woke up in the night, crying with earache. We put on the Lamp and in about 10 minutes, the pain was all gone and she had gone back to sleep, and the next morning, did not complain of it at all. You can refer anyone to us."

Easy Payments Bring Campbell's Infra-Red Ray Lamp Within the Reach of Every Family

A small down payment of only a few dollars gives you, and yours, the benefits of the wonderful Infra-Red Ray treatments. Monthly payments are so small you will never miss them, and almost before you know it—the Campbell Infra-Red Ray Lamp is paid for, because its price is extremely low anyway. This is mainly due to the fact that we sell it direct from the factory to you—thus cutting out salesmen's salaries, jobber and retailer profits. If we had traveling salesman or sold the Campbell Lamp through dealers, the price would be very much more—for someone has to pay for all of this. A rock-bottom price and my easy payment plan surely makes it possible for you to order your Campbell Infra-Red Ray Lamp right away.

Influenza Cases Relieved with Infra-Red Ray Treatments

The treatment suggested for influenza cases is application of the Rays to the areas marked One, Two, Three, Five and Six as specified on the charts printed on page 18.

A most remarkable case brought to our attention is that of a man 86 years old, Mr. J. L. Pinnock, 663 Wright Avenue, Alliance, Ohio, who wrote us:

"On the 15th day of June, 1923, I received a severe injury to my back. It was so severe that I could not stand or help myself. My doctor told me that nothing could be done, but that the trouble would soon wear out. It was more than a month after this before I could stand on my feet or move about. I had to use a cane.

"This was my condition until this year (1927), when I had an attack of Flu. This finally settled in my back, causing excruciating pain. About April 14th, having recovered somewhat, and having been told of some of the cures brought about by the use of your Campbell Infra-Red Ray Lamp, I got my son to take me to your factory. I brought a lamp home with me.

"That evening I took the first treatment. I felt relieved. After the fourth or fifth, the pain from which I had suffered almost four years, completely disappeared. Now, after a month, the pain has never returned . . . . and I consider myself a cured man.

"Prior to using your lamp I treated with physicians of almost every faith and used all the electric devices that I know of such as the Violet Ray, Electric Pads, Electric Belts, etc., but received no relief from any of them."

Mrs. Crittenden, Conneaut, Ohio (R. F. D. No. 1, Box 20), stated:

"One day I was sure I was coming down with the Flu and two thorough treatments brought great relief. In two days I was nearly normal again."

Mr. Wm. Campbell, President,
The Wm. Campbell Company,
Alliance, Ohio

Dear Mr. Campbell:

As a result of using the Campbell Infra-Red Ray Lamp upon a number of my patients, I found the results very gratifying in cases of cold in the head, sore throat, neuritis and other ailments of a rheumatic tendency.

I feel gratified in recommending the Lamp and know that it has great therapeutic possibilities.

Upon one application of a severe case of tonsilitis there was a marked relief in thirty minutes. A case of neuritis of long standing, similarly relieved by two applications of thirty minutes each.

It is a pleasure to recommend this wonderful Lamp.

Yours very truly,
H. C. Macy, M. D.
c/o *Chicago Athletic Association,*
Chicago, Illinois

Mr. Frank L. Wood, Petersburg, Mich., is very enthusiastic over Infra-Red Ray treatments, as will be noted upon reading his letter:

"My personal ailments, treated with Campbell's Infra-Red Ray Lamp . . . . four treatments of thirty minutes each . . . . have satisfied me completely. The lamp is the last word in health. Catarrh, inflamed eyes, lungs, lumbago, spine, prostate gland, and throat trouble were all mine. Sunday morning (I had been troubled with my lungs prior to this), a congestion warned me that pneumonia might set in as each breath caused a pain. I placed the lamp at the side of the bed, laid down, and took a thirty minute treatment. The effect was entirely satisfactory. The Infra-Red Ray did the job."

For Colds in Chest and Bronchial Trouble

Recommended by Noted Physician

The January 1927 issue of the Medical Review of Reviews carries an interesting article of Frank Thomas Woodbury, B. A., M. D., on Radiation Therapy and Radiothermy:

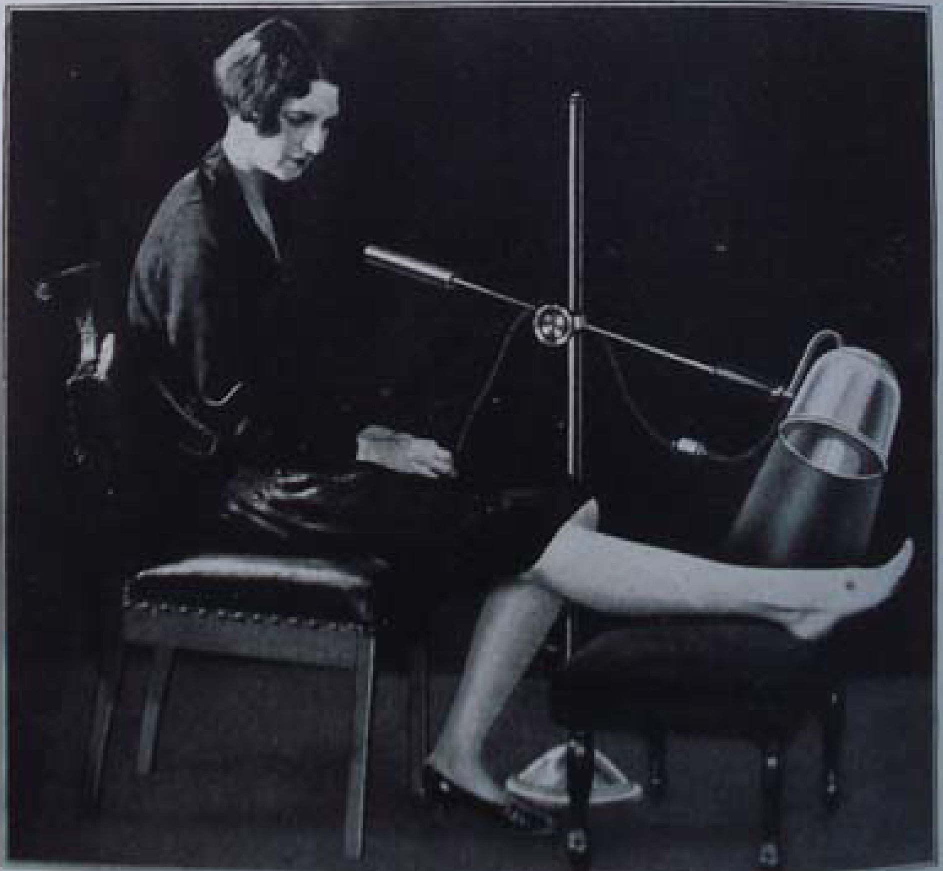
"I desire to bring to your attention a form of energy which has been woefully slighted because it is not spectacular, yet it should be in every physician's office and at every hospital bedside. I refer to the use of radiant energy from heated sources which, when it penetrates, is converted into molecular kinetic energy of the cells, to wit, heat."

"The indications for the focal radiothermy are first: Infection, wherever present except when pus is walled in by circumscribing tissues. Thus all natural cavities with natural drainage openings containing pus will drain their pus through those openings when heated. Closed cavities, which are drained by incision, resolve better under radiothermy. Thus acute inflammation of frontal, ethmoidal, sphenoidal, and antral cavities (commonly called sinus infections) of mastoid and middle ear, of gall bladder, kidneys, uterus, salpings (ovarian), urinary bladder are promptly relieved and chronic purulent accumulations are slowly evacuated, absorbed and resolved."

In this book you will find a number of letters from users of the Campbell Infra-Red Ray Lamp stating the results secured by them in treating many of the ailments just mentioned by Dr. Woodbury as being benefitted by Infra-Red Ray treatment.

Continuing, Dr. Woodbury states in his article: "Coryza (head cold), sore throat, bronchitis, pneumonia, whooping cough, pimples, boils, carbuncles, and open wounds are rapidly improved, while for gonorrheal ophthalmia (eye infection), it is a specific as proven by Thomson, Snow and others."

"Active Retinitis and conjunctivitis, acute cellutitis with ascending lymphangitis (all eye infections), and erysipelas are promptly



Feet Troubles Leave Rapidly Under the Soothing Rays of Campbell's Infra Red Rays Lamp

What Infra-Red Rays Will Do

checked and cured by radiothermy. It may be used for acute urethritis and for pelvic and vaginal infections.

It reduces the swelling of contusions, sprains and exudates, of phlebitis (inflammation of a vein), and adenitis (inflammation of a gland). It is healing in infected wounds, ulcers and granulation tissue and prevents scarring."

"Local radiothermy (heat treatment) should be employed as a routine measure to prevent complications in all infectious conditions where complications are frequent, therefore in measles. Radiothermy of the chest will prevent broncho-pneumonia, radiothermy of the ears will prevent otitis media (inflammation of the middle ear) and mastoiditis.

In scarlet fever radiothermy over the kidneys is indicated. It will prevent parotitis (mumps) becoming epididymitis (inflammation of testicles). It will prevent ether pneumonia and reduce the spasms of whooping cough.

"In hypothermia (chill) following exposure as drowning or freezing, it is indicated after restoration to consciousness. It will check and ameliorate an x-ray erythema (burn) and should be used in all cases where an x-ray erythemia is appearing. This valuable observation is due to Snow."

Dr. "Snow," mentioned here by Dr. Woodbury, is a prominent physician who has given considerable time to the study of Infra-Red Ray treatments.

Dr. Woodbury's article continues: "It will soothe and heal a burn, obviating the use of dressings, ointments and anodynes."

"It is useful in impaired local circulation as angio-neurotic edema, Raynaud's disease, diabetic gangrene, phlebitis (inflammation of vein), and contusions. It will relieve the inflammatory swelling of spinal nerve and inflammation as anteriopoliomyelitis (bone infection) and restore circulation and nutrition in wasted muscles. It will relax muscular spasm about subluzations and dislocations, facilitating manipulation."

"Systemic radiothermy (heat treatment), as it equalizes the circulatory tension, is useful in embarrassed hearts with high cardiovascular pressure (high blood pressure). It tends to relief of autointoxication through increase of urinary solids and perspiration. It improves cases of subnormal temperature and subnormal combustion."

"It is useful for shock after operation, injury, hemorrhage, freezing, drowning, etc. It is especially valuable in septicemia, sapremia and pyemia (a morbid poisoning of the entire system), restoring pulse, reducing temperature, overcoming the infection."

* * *

Dr. Woodbury's article is an authoritative medical opinion as to the healing value of Infra-Red Ray treatment for a large variety of human ailments . . . all of which are, of course, stated in medical language. Actual results secured with Infra-Red Ray treatment for many of the ailments mentioned in Dr. Woodbury's report will be noted by you in the letters quoted from people who have used, or are now using, Campbell's Infra-Red Ray Lamp.

Its Use Saves You a Lot of Money

An important reason for having a Campbell Infra-Red Ray Lamp in your home is its efficiency in preventing serious illnesses; and if this were the only reason for securing it, the Campbell Lamp would be worth several times its cost simply because its use in time, will prevent many costly bed-confining ailments.

Relieves Sore Throat At Once

Women's Ailments and Infra-Red Ray Treatments

While physicians and nurses will tell you that women can stand the most agonizing pain without flinching, and much more courageously than men, they will also tell you that the delicate organism of a woman is responsible for a great deal of pain from apparently very trivial causes. A number of women have been able to secure relief from ailments peculiar to women, with Infra-Red Ray treatments, as these letters indicate.

Ovarian Trouble Relieved

Mrs. Mary F. I——, 412 Copeland St., Brodston, Mass., wrote:

"My daughter has suffered from an ovarian trouble for fifteen years and the Campbell Infra-Red Ray Lamp is relieving her. I have no doubt it will cure her in a short time, for the pain will stop as soon as the heat is applied."

Child Birth Troubles Helped

Mrs. W. A. V——, Glendale, California, wrote very frankly as follows:

"In February (1927) I took very sick and had to go to the hospital for an operation. I had a tuburol pregnancy. The operation was a success, but I had such pains after and a terrible soreness. I was in bed six weeks. When I got up the soreness was still there. Some days I could hardly bear it. The doctors said it was caused from the uterus being so enlarged, as I had had so many operations before this one."

"They prescribed so many things for me to do, and I was to go to the office twice a week for treatments. Well, I went for three and didn't feel any better so decided to send for the Campbell Infra-Red Ray Lamp."

"I have been taking three abdominal treatments a week with it since I got it, and find that in the two weeks I have used it that I feel better, much better, in every way. The soreness is leaving me and the pains I had through the abdomen are gone entirely."

* * *

Hugh C——, Canton, Ohio, says: "Wife started using the Lamp this month a day before she expected the cramps and was certainly surprised and pleased when she did not have a single cramp during the entire time."

Girl's Menstruation Pains Stopped

Here is what the father of Miss Esther H——, Reedley, California, wrote us regarding the wonderful benefits of Infra-Red Ray treatments for girls:

"My sixteen-year-old daughter, Esther, the last three years has had to take some nasty tablets given us by the family doctor every month on account of having very painful menstruation periods. Sometimes she would miss school for two days. These pains were very severe, nearly unbearable, causing her to cry and moan.

"We used tablets, hot water bottles, and other home remedies to no avail. The first time she had one of these periods after the Campbell Infra-Red Ray Lamp arrived my wife used it on her, and she only missed the forenoon from school. It was used again for the same purpose only last week, and it sure stops the pain in no time."

"Our family doctor endorsed the lamp very highly."

Relieves Women's Pains Like Magic

Only a Mother Could Have Written This

I have raised a family of six children, and know that much of their illness and suffering might have been eliminated had we had the advantage of using the Infra-Red Ray Lamp that Mr. Campbell has lately perfected.

The boys came in many times with wet feet which resulted in croup, colds, and sometimes bronchitis, and even pneumonia. This all meant loss of many nights' sleep for me, as well as the children. If the lamp had been in our home then, ready for use at any time of the day or night, our troubles would have been greatly decreased.

With an Infra-Red Ray Lamp in the house, the mother can readily help the sick ones, without always having doctor bills to pay. In the average home with small children, far too much money has to be paid for doctor bills, oftentimes leaving very little for clothes and recreation.

By using the Campbell Infra-Red Ray Lamp when the first symptoms of trouble appear, and keeping up the treatment a few times, quite often all source of trouble will disappear, and so much anxiety and loss of sleep will be prevented.

Prevention of disease—that is what we aim for nowadays and that is what we can have with the Infra-Red Ray Lamp.

Just how wonderful this lamp is, you will discover when you use it to relieve neuralgia, neuritis, rheumatism, hay fever, sinus trouble, and many more diseases too numerous to mention in this book.

Try one in your own home, and before long you will be urging all your friends to purchase one of our Infra-Red Ray Lamps.

Alexandra E. Campbell

* * *

The full extent to which Infra-Red Ray treatments will benefit mankind in relieving scores of serious and minor ailments cannot be answered today by the medical profession. Hardly a month passes but what some stubborn ailment that has defied medical attention yields to the soothing, healing properties of Infra-Red Rays . . . such as noted in the unusual letter just quoted above. There are thousands of men and women of all ages suffering today from ailments that should be relieved with Infra-Red Ray treatments, and undoubtedly would be. The very low price of the Campbell's Infra-Red Ray Lamp brings health within the reach of nearly every person who is suffering.

Infra-Red Ray Treatments Relieve Headaches

While the majority of people buying the Campbell Infra-Red Ray Lamp get it specifically for the treatment of some more or less serious ailment, invariably they find a great many other uses for Infra-Red Ray treatments in relieving other members of the family from commonplace ailments. The following excerpts taken from a few of the many letters in our files indicates the healing superiority of Infra-Red Ray treatments for minor troubles over the usual patent medicines used for headaches, etc.

Severe Burn Helped

"I had a severe burn as large as a teacup on my arm," wrote Mrs. C. A. Crittenden, "and I turned the Campbell Infra-Red Ray Lamp right on it and took out every bit of fire. It stayed red for two days, and pealed, but absolutely did not hurt one bit after I used the Infra-Red Rays on it."

Son's Headache Relieved

"One evening my son who is a high school boy," wrote Mrs. M. S. Fonda, "had a bad headache. As he was anxious to prepare his lessons, he adjusted the Campbell Infra-Red Ray Lamp on the back of his neck and began to study. His headache was soon relieved, and when he had completed his lessons he felt fine."

Headache Disappears Like Magic

Mrs. Hayman, Box 387, R. F. D., Tampa, Fla., wrote: "It is magical the way the headache disappears, when you use the Campbell Infra-Red Ray Lamp. The lamp seems to cure soreness in any part of the body . . . stiff neck, sore throat, etc., and is good for any pain in any part of the body."

"Best for Indigestion," He Says:

Mr. G. L. Morrison, Mason, Ohio, states: "I have indigestion spells. I had one last week. I was up town and felt it coming on, so hurried home and told my wife to get my medicine quick. She suggested using the Campbell Infra-Red Ray Lamp instead, so she got it ready and I turned it right on the spot where the pain was. I don't think it was over five minutes until I got relief. That is the best thing I ever tried."

Singer's Throat Helped

C. Leroy Lyon, St. Petersburg, Fla., gave us this interesting experience with Infra-Red Ray treatments. "I am a teacher of singing and used the lamp on my throat when my vocal chords were lame, tired and sore from overwork. In thirty minutes I felt them relax."

Treatments Restored Speaking

C. B. Alexander, 191 W. Main St., Alliance, Ohio, says: "Last week my wife contracted a sore throat and completely lost her voice. I immediately ordered a Campbell's Infra-Red Ray Lamp. She used it in the afternoon for perhaps half an hour and I used it on her neck, back, and both sides of her throat in the evening. Before retiring, she could say a few words that were understandable. With another treatment the next day, she was able to talk with very little huskiness and *the following day was completely cured.*

Sore Throat Relieved

Lester R. Ruth says: "It does not often happen when a newspaper man goes after a story, that he also gets a 'cure,' but that's my experience. I had a bad sore throat and thought it was due to tonsillitis. The twenty-minute treatment took away the swelling and the soreness. I expected the trouble to return the next morning, but much to my surprise the throat stayed cured."

Pain Stopped in Crushed Fingers

"I had my fingers caught at the second joints all the way across, when a man slammed one of the heavy swinging doors at the bank. They were badly bruised and very painful," Mrs. C. A. Campbell wrote. "I used the Infra-Red Rays on them several times and was surprised at how soon they were nearly normal. The pain is gone and I can use them."

Relieved Pain From Bad Fall

Mrs. Ella S. Heath, 959 Cadle Ave., Mentor, Ohio, wrote: "I had the misfortune to fall from the steps and struck the cement walk on my right shoulder. As I could not use my arm, had to wait until help came. They helped me into the house and put the Infra-

Sore Throat, Indigesti

Red Rays on the arm and shoulder at nine o'clock, then again at about one o'clock. It drew the bruise out all across my chest. In two weeks I could dress myself and comb my hair, which I thought was wonderful. Did not call a doctor."

Eases Tired Back

"I notice if my back gets very tired, a treatment soothes and relieves it in a short time," Mrs. W. H. Carleton, Cooperstown, N. D.,

Benefitted Greatly

in Philadelphia. I find that the Campbell Infra-Red Ray Lamp has done more for me in two months than all the doctors."

Gall-Bladder Case Relieved

Mr. Wm. E. Davis, President, Stark Electric Railway, Alliance, Ohio, has this to say about the therapeutic value of Infra-Red Ray treatments:

"The Infra-Red Ray Lamp of yours has certainly been wonderful for me. I had a continuous pain in the region of my Gall Bladder, and taking about a half-hour treatment two or three times a week keeps me 'fit as a fiddle.' "

ated by Physician

when several doctors—including myself—had failed to get results. The patient, who was confined to the bed for several months, improved from the first treatment and h since gained very rapidly and is now

How Often Have You Had a Stiff Neck? Relieve It Quickly with Infra-Red Rays

Pays for Itself Many Times Over

If Infra-Red Ray treatments were valuable only for the relief of commonplace family ills, Campbell's Lamp would more than justify its low cost. But, when you consider the high regard placed upon its therapeutic value in treating serious ailments by some of the foremost medical authorities, there is every reason why you should have the Campbell Infra-Red Ray Lamp in your home—ready instantly day or night to bring relief to those who are ill.

Infra-Red Ray Treatme ating Sinus Troubles

While the majority of people buying specifically for the treatment of some m find a great many other uses for Infra-Red of the family from commonplace ailments of the many letters in our files indicates treatments for minor troubles over the usu

Severe Burn Helped

"I had a severe burn as large as a teacup on my arm," wrote Mrs. C. A. Crittenden, "and I turned the Campbell Infra-Red Ray Lamp right on it and took out every bit of fire. It stayed red for two days, and pealed, but absolutely did not hurt one bit after I used the Infra-Red Rays on it."

Son's Headache Relieved

"One son who is a high scho be

atments Mo Specialis

"I have been using the Campbell Infra-Red Ray Lamp for sinus trouble," wrote Mrs. E. D. Hayman, R. F. D. No. 3, Tampa, Florida. "Had been going to specialist every now and then for treatments, and believe now I won't have any more trouble as my head feels clearer and better. There is no soreness in the bones, as before. Treatments from a specialist are painful, while this kind are soothing and *give instant relief.*"

Campbell's Lamp Saves Money

In the two instances cited just previous, there can be no question but what these two women paid fees to specialists which would have covered the purchase price of the Campbell Infra-Red Ray Lamp several times over. A thorough reading of this book will reveal that people suffering from almost every ailment under the sun have used Infra-Red Ray treatments successfully. The beneficial results obtained in such a wide variety of ailments are due to the fact that, as stated more fully in the forepart of the book, most ailments are caused by some form of spinal congestion in the body. Infra-Red Rays, when used as directed, invariably relieve this congestion and therefore bring relief. Relief, as the many letters quoted herein clearly prove, is frequently secured when all other methods, treatments, etc., failed.

Asthma Relieved

James F. Davis, 742 N. Garfield Ave., Alliance, Ohio, says:

"I just want to tell you what a God-send your Infra-Ray Lamp was for me the other night.

"I had been propped up in bed for four days with Asthma, coughing continually and getting no rest.

"I used the lamp one hour with such wonderful relief that I was able to lie down and sleep perfectly. Another treatment the next morning seems to have entirely fixed me."

Chronic Pain Gone

Tom J. Muir, Sales Office Mgr., The Morgan Engineering Company, Alliance, Ohio, says:

"I have had a chronic pain at the base of my neck for over twelve years. Physicians and Chiropractors failed to give any permanent relief. The application of various brands of liniments, rubbing oils, salves and treatments with vibrators, violet ray machines and heating pads proved of no value.

"The first treatment with the Campbell Infra-Red Lamp, proved conclusively that at last I had found something that reached the spot and the penetrating rays were both soothing and beneficial.

"While I have taken but one treatment a day for over three consecutive days I can truthfully state that I am relieved of the chronic pain for the first time in over twelve years."

Now Hay Fever Sufferers Can Get Positive Relief

Thousands suffer every year from hay fever, and thousands of dollars are spent annually by sufferers traveling from one location to another—and upon patent medicines—in a vain effort to obtain relief from one of the most irritating ailments known to man. If you're one of the unfortunate people who have tried everything to get relief from hay fever, you will be glad to know that Infra-Red Ray treatments will absolutely relieve you. All we ask is a chance to prove this statement to you. Just use the Campbell Infra-Red Ray Lamp the minute you feel the first symptoms of hay fever coming on. You will find that it brings relief immediately.

Bladder Troubles Benefitted Greatly

Patients with different forms of bladder trouble have derived high therapeutic benefits from Infra-Red Ray treatments, which will be noted upon reading the letters various purchasers of the Campbell Infra-Red Ray Lamp have written.

Suffered With Catarrh of Bladder for Ten Years

Here is what Mr. L. E. Stigers, 410 S. Union St., Wilmington, Delaware, wrote:

"I have had catarrh of the bladder for the last ten years and have doctored with six different doctors, two of whom are specialists in Philadelphia. I find that the Campbell Infra-Red Ray Lamp has done more for me in two months than all the doctors."

Gall-Bladder Case Relieved

Mr. Wm. E. Davis, President, Stark Electric Railway, Alliance, Ohio, has this to say about the therapeutic value of Infra-Red Ray treatments:

"The Infra-Red Ray Lamp of yours has certainly been wonderful for me. I had a continuous pain in the region of my Gall Bladder, and taking about a half-hour treatment two or three times a week keeps me 'fit as a fiddle.' "

Arthritis Case Treated by Physician

We are very greatly indebted to Dr. L. Cook, Brownsville, Texas, for writing us as follows:

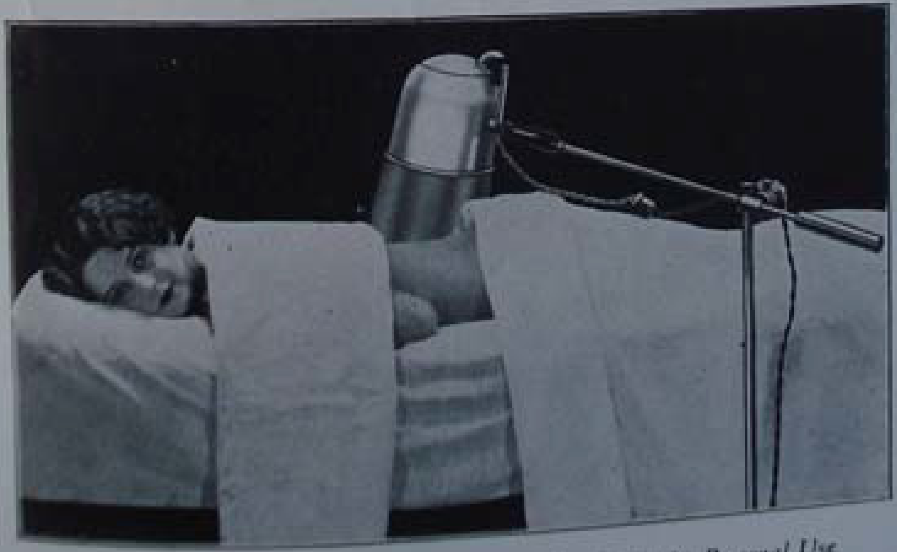
"I have been using one of your Campbell's Infra-Red Ray Lamps in my practice for over a month now, and I find it very efficient in producing relaxation of the muscles and relieving the inflammation and pain.

"I used it on a case of Arthritis Deformans, when several doctors—including myself—had failed to get results. The patient, who was confined to the bed for several months, improved from the first treatment and has since gained very rapidly and is now about the streets.

"I use the lamp on every one of my patients and my practice has increased 50% in the past month. I would not do without it. May God bless you for inventing such a pain reliever."

[illegible] matter [illegible] have tried . . . . [illegible] you can be relieved. You will note from many of the letters quoted in this book that Campbell's Infra-Red Ray Lamp treatments have brought relief that bordered on the miraculous.

[illegible] You'll feel a sight better right after you finish up the first treatment. Usually, unless you have a particularly stubborn case of many years' standing, it does not take many treatments to put you on your feet again—feeling as young and frisky as a two-year-old colt out in the pasture.



Every Woman Should Own An Infra-Red Ray Lamp for Personal Use

Mothers Need Worry No Longer—When Children Wake Up Sick, in the Night

A quivering, frightened cry for "Mother!" from the children's bedroom late at night brings mother out of bed instantly . . . with her heart in her mouth. Junior can hardly breathe. You're torn between anxiety for your child and the doctor's anger at being aroused out of a warm bed to find nothing seriously wrong.

Every mother has learned to dread these morning attacks of sickness; every father has wished that if children had to get sick they would get sick during the day instead of always at night—late.

The father of a boy five years old told me that my lamp would be worth twice the price in not only helping his boy . . . but also in relieving him of worry in the early morning hours when his youngster started coughing. His boy has bronchitis. He will be tucked away at night apparently sound as a

Ray Lamp Boe entirely too often for the D. Hayman, R. F. D. No. 3, Tampa, Florida,

"Had been going to specialist every now and then for treatments, and believe now I won't have any more trouble as my head feels clearer and better. There is no soreness in the bones, as before. Treatments from a specialist are painful, while this kind are soothing and *give instant relief.*"

Campbell's Lamp Saves Money

In the two instances cited just previous, there can be no question but what these two women paid fees to specialists which would have covered the purchase price of the Campbell Infra-Red Ray Lamp several times over. A thorough reading of this book will reveal that people suffering from almost every ailment

have been told that "there was nothing seriously wrong with the boy; he'd be all right in the morning." And, he was, too. But you never know.

Now, with the Campbell Infra-Red Ray Lamp in their home, whenever the boy has a spell they simply give him a treatment that relieves his breathing apparatus quickly and inside of half an hour or so the whole family is sleeping soundly again. Is it any wonder that this father is so grateful for the Campbell Infra-Red Ray Lamp?

Every home where there are children have had similar experiences. Youngsters seem to get sick inside of a few minutes and to get well about as quickly. With the Campbell Lamp in the house, you're always prepared. You can at least be doing something practical for the child even though you do call the doctor, and your doctor will approve of the Infra-Red Ray treatments—for their healing and [illegible] reliance.

[illegible]ative value have now [illegible]

"I have had a chronic pain at the base of my neck for over twelve years. Physicians and Chiropractors failed to give any permanent relief. The application of various brands of liniments, rubbing oils, salves and treatments with vibrators, violet ray machines and heating pads proved of no value.

"The first treatment with the Campbell Infra-Red Lamp, proved conclusively that at last I had found something that reached the spot and the penetrating rays were both soothing and beneficial.

"While I have taken but one treatment a day for over three consecutive days I can truthfully state that I am relieved of the chronic pain for the first time in over twelve years."

Now Hay Fever Sufferers Can Get Positive Relief

Thousands suffer every year from hay fever, and thousands of dollars are spent annually by sufferers traveling from one location to another—and upon patent medicines—in a vain effort to obtain relief from one of the most irritating ailments known to man. If you're one of the unfortunate people who have tried everything to get relief from hay fever, you will be glad to know that Infra-Red Ray treatments will absolutely relieve you. All we ask is a chance to prove this statement to you. Just use the Campbell Infra-Red Ray Lamp the minute you feel the first symptoms of hay fever coming on. You will find that it brings relief immediately.

Every Home Needs Campbell's Infra-Red Ray Lamp—One Treatment Will Convince You

Infra-Red Ray treatments help men and women of all ages to keep youth, health, strength and beauty. Ailments, afflictions, diseases and ill health probably cause more unhappiness among families than anything else. People who are strong and healthy invariably are good-looking. . . . and easy to get along with. The chief purpose of the Campbell Infra-Red Ray Lamp is to make it possible for men and women and children to be healthy. It does this by relieving pain and preventing illness. Campbell's Infra-Red Ray Lamp will help women to stay youthful and beautiful, and its use as need arises will save you many hours of agonizing pain that cause premature age-wrinkles and crow's-feet.

Your Case is Never Hopeless

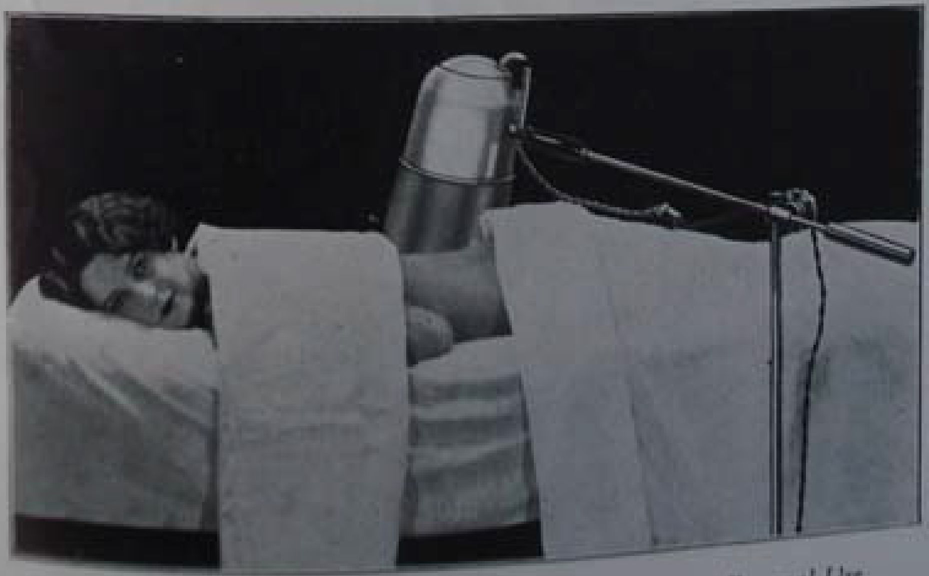
No matter how long you may have suffered from some ailment . . . . no matter how many different things you have tried . . . . never give up hope that you can be relieved. You will note from many of the letters quoted in this book that Campbell's Infra-Red Ray Lamp treatments have brought relief that bordered on the miraculous.

"It Runs in the Family," He Said

There's a lot of old-timers with rheumatism and other ailments who grew up with the belief that certain ailments run in their families and there wasn't any use trying to cure them. Doctors will tell you that is nonsense pure and simple. Just because your father had rheumatism and his father had it is no reason why you must be afflicted with it. If you're troubled with some ailment that "runs in your family" I want you to get one of my lamps . . . . and just see how that ailment goes away when Infra-Red Rays go after it.

One Treatment Brings Relief

I don't claim that one treatment will cure you, but I do guarantee that one treatment will help you. You'll feel a sight better right after you finish up the first treatment. Usually, unless you have a particularly stubborn case of many years' standing, it does not take many treatments to put you on your feet again—feeling as young and frisky as a two-year-old colt out in the pasture.



Every Woman Should Own An Infra-Red Ray Lamp for Personal Use

Send Today for *Your* Campbell's Infra-Red Ray Lamp

It will pay for itself a dozen times over. It will relieve and benefit serious ailments, as the facts in the book prove. It will save medical and hospital bills. It will prevent serious ailments. It will save hours of agonizing pain and irritating discomfort. Just the knowledge that the Campbell Infra-Red Ray Lamp is in your house—ready for instant use at any hour—is reason enough to mail your order at once.

Just think, for a moment, of what it does mean to have this wonderful lamp in your home. It means that when anyone in your family becomes ill, you have a healing apparatus in your own home which is endorsed and recommended by leading physicians; an apparatus that people of all ages state in this book has relieved them of pain and brought recovery when all other medical treatment had failed.

Isn't that alone worth twice the cost of the lamp? Certainly it is! Now, I want you to understand why the price of this Campbell Infra-Red Ray Lamp is so low . . . a great deal cheaper than it would be ordinarily. It is made in our own factory, here in Alliance. It is sold direct from this factory to you. This means an immense saving to you.

We have no salesmen. If we did, the price would be much higher. We do not sell through jobbers and dealers. If we did, the jobber's profit and the dealer's profit would have to be tacked on to the price. All of these expenses and profits are cut out . . . simply by selling direct to you from our factory.

You get your Campbell Infra-Red Ray Lamp at the lowest possible price. You get a lamp that in efficiency is the equal of the most costly apparatus used in hospitals in the generation of Infra-Red Rays. More than all of this, however, you have thirty whole days in which to test the lamp—just to see if it relieves ailments and pains, just to see if you are wholly satisfied with it. You will be, I know. One treatment will do more to convince you of the wonderful benefits of Infra-Red Rays in relieving pain than anything else. That is why I want you to mail your order today . . . and use this lamp on trial in your own home for thirty days. Isn't this the easiest, quickest and surest way for you to find out exactly what Infra-Red Rays will do for you? Surely, it is, so take the order blank enclosed . . . fill it out . . . and put it in the mail box right away.

THE WILLIAM CAMPBELL COMPANY
ALLIANCE, OHIO

We have many wonderful cases of where Campbell's
ferers around our own home city before we offer
he mails. For example, Tom J. Muir of this c

onic pain at the back of my neck for over
ropractors failed to give any permanent
ous brands of liniments, rubbing oil
violet ray machines and heating

From William Campbe
The William Campbell
Alliance, Ohio

the 'Campbell Infra-Red
mething that reached
eneficial."

I am going t[illegible] .t the wonderful therapeutic lamp and, then tell you how you can use it in your own home by letting me send it to you on approval.

If this was just an ordinary aid to health, possibly I would not be so enthusiastic about it, but this device -- Campbell's Infra-Red Ray Lamp -- is an extraordinary discovery. Its results are really sensational. It has brought relief from many different kinds of ailments and from many, many people. It has restored cheer and happiness in homes where suffering reigned before. It has brightened people's lives -- taken away misery and brought comfort -- glorious relief from ailments.

Have you or has some one in your home ever laid awake all night suffering with congestion in the head, throat, bronchial tubes or a sever pain in some other part of the body? Wouldn't it have been a blessing if you had one of these Campbell Infra-Red Ray Lamps to relieve congestion and allow restored blood circulation to remove the cause of the trouble?

If you or some one in your home is suffering from some ailment right now, this is exactly what I want to do -- send you one of Campbell's Infra-Red Ray Lamps and let you see for yourself the wonderful results it will accomplish.

Now you may ask, as you possibly did when you read our advertisement, "What are Infra-Red Rays?" See Page 4 of our catalog which we are sending you with this letter. Infra-Red Rays are like concentrated sunshine. They are rays thrown off from the heating element in the lamp when it is heated up to a dark cherry red. These rays penetrate and as they penetrate they create a mild, soothing, beneficial heat which softens the tissues and allows the blood to circulate freely through the congested area.

Infra-Red Rays are invisible. They penetrate deeply into the body -- some authorities state they they penetrate as far as four to six inches, so that you can see they accomplish results which just could not be possible with hot water bottles, electric pads, salt bags or other methods of applying heat to the body.

We have many wonderful cases of where Campbell's Lamp brought relief to sufferers around our own home city before we offered the Lamp for sale through the mails. For example, Tom J. Muir of this city says,

"I have had a chronic pain at the base of my neck for over twelve years. Physicians and Chiropractors failed to give any permanent relief. The application of various brands of liniments, rubbing oils, salves and treatments with vibrators, violet ray machines and heating pads proved of no value.

The first treatment with the 'Campbell Infra-Red Ray Lamp' proved conclusively that at last I had found something that reached the spot and the penetrating rays were both soothing and beneficial."

Wm. E. Davis, Pres. Stark Electric Railway, Alliance, Ohio, says,

"The Infra-Red Rays Lamp has certainly been wonderful for me.

I had a continuous pain in the region of my Gall-Bladder, and by taking half-hour treatments with the Infra-Red Ray Lamp, I am greatly relieved, and treatments taken two or three times a week, keep me as 'fit as a fiddle.'"

EVERY HOME NEEDS THIS WONDERFUL
LAMP

Have you ever gotten up in the morning with a stiff neck? Have you ever contracted an unexpected bad cold -- and then suffered and suffered and wondered what you could do to get rid of it? Did children ever awaken you at night or tell you in the morning that they had a pain? Have you ever had a terror of hearing a cough at night and know that one of your children has contracted another cold and then wondered what it would lead to? This is the time when you will need a Campbell Lamp and need it badly. ONE GOOD INFRA-RED RAY TREATMENT TAKEN IN TIME MAY SAVE YOU FAR MORE THAN ALL THE BEST DOCTORS COULD POSSIBLY DO LATER.

We have children in our own home and we are talking from experience Also the experience of users of our Lamps, now in many other cities.

Have you ever had a bad bruise -- a bad sprain -- has some one in your home ever suffered with a sprained ankle -- is there someone in your home suffering from rheumatism -- attacks of neuritis -- head noises -- catarrhal deafness? Infra-Red Ray treatments have relieved these ailments. Why let them continue in your home?

AND YOU CAN AFFORD IT. When you think of how little it costs to have thi ever-ready -- inexpensive source of relief in your home, there is just no reason for your not ordering it at once. The first cost is the only cost except for the ridiculously small cost of electricity which is less than one-half your electric light rate per hour.

There is nothing to wear out -- nothing to give out -- nothing to replace on the lamp. It should last for years and years and there is many a time when you could more than save its cost by preventing just one doctor bill.

I shall be glad to send you a Lamp on the conditions that you will keep it at least thirty days and apply treatments as often and in as many ways as you desire. If you will do this, I am sure that you will want a Lamp even if it was four times the price.

MANY AILMENTS RESPOND TO INFRA-RED RAY TREATMENTS. Read the letters from users. You will find many of them in our catalog. Note the number of ailments mentioned on pages 16 and 18 which have been treated with Infra-Red Rays. When you think of the fact that Infra-Red Rays penetrate into the body and restore blood circulation, it is not difficult to see how this simple therapeutic lamp can bring relief from so many different ailments.

Leading physicians recommend Infra-Red Ray treatments. Dr. H. C. Macy of the Chicago Athletic Association, Chicago states that he has used the Campbell Infra-Red Ray Lamp on a number of patients and found the results were gratifying in cases of colds in the head, sore throat, neuritis and other ailments of rheumatic tendency. After one application for a severe case of tonsilitis, he found a remarkable relief in thirty minutes time. A case of neuritis of long standing was similarly relieved by two applications.

WILL YOU LET ME SEND YOU A LAMP ON APPROVAL? Surely nothing could be more important than preserving health and happiness in your home. If you are suffering from any ailment that can be treated by Infra-Red Rays, by all means, let me send you an Infra-Red Ray Lamp at once. Send cash with order -- $25.00, to be held just on approval, with the understanding that you can return it in thirty days if it does not prove everything we say about it. You will bless the day you order one of these lamps -- I am sure of it. For your convenience, I am enclosing an order blank.

There is nothing else like it ever offered. We are sending out many, many lamps every day to all parts of the country -- every one goes out on approval -- the same offer I am making to you and they never come back because people find them to be exactly what they have long desired, just as I am sure you will when the lamp arrives in your home.

Will you let me hear from you by return mail? I shall be glad to send you a lamp at once.

Yours for good health,

William Campbell

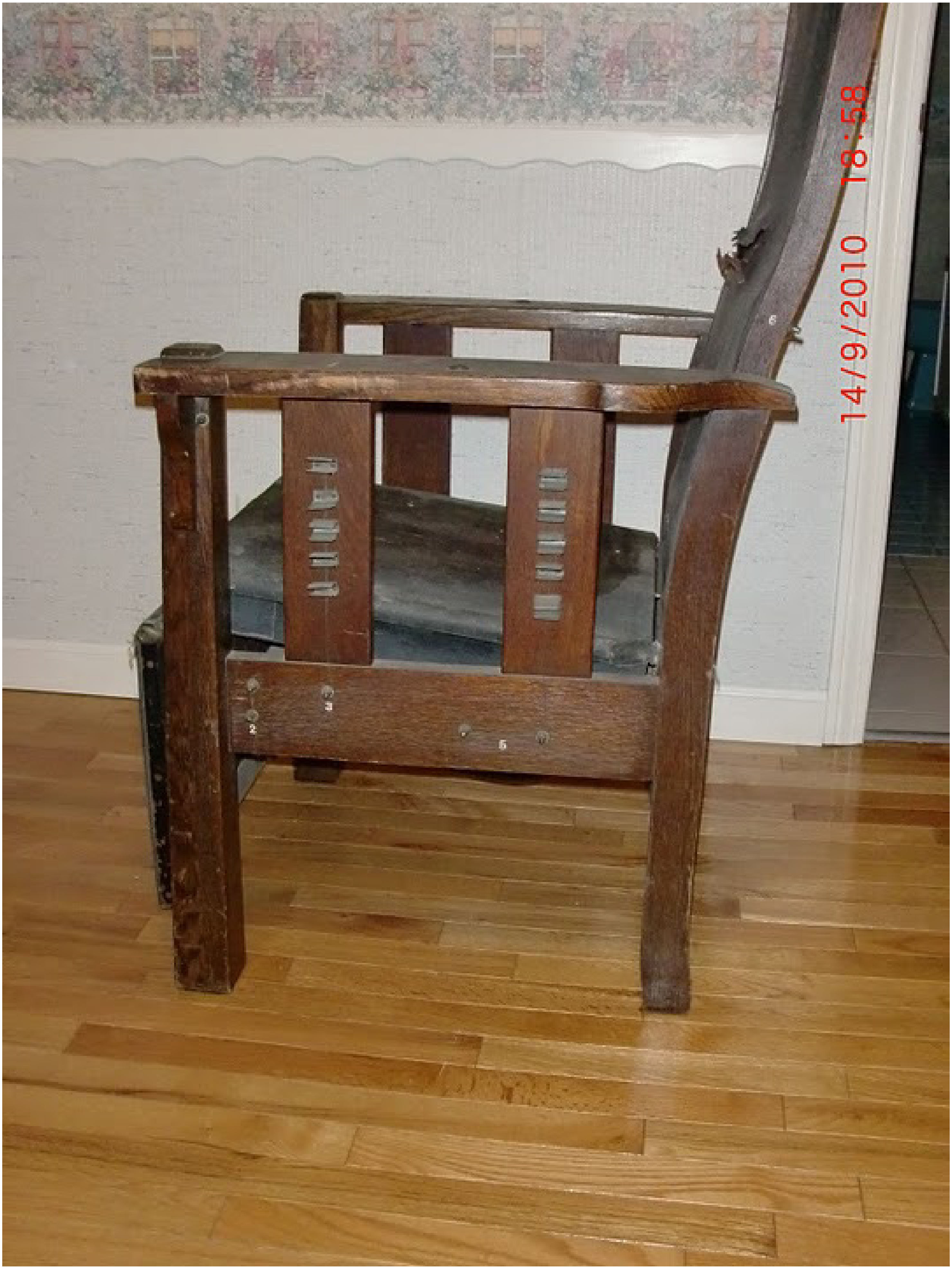
14/9/2010 18:57

14/9/2010 18:57

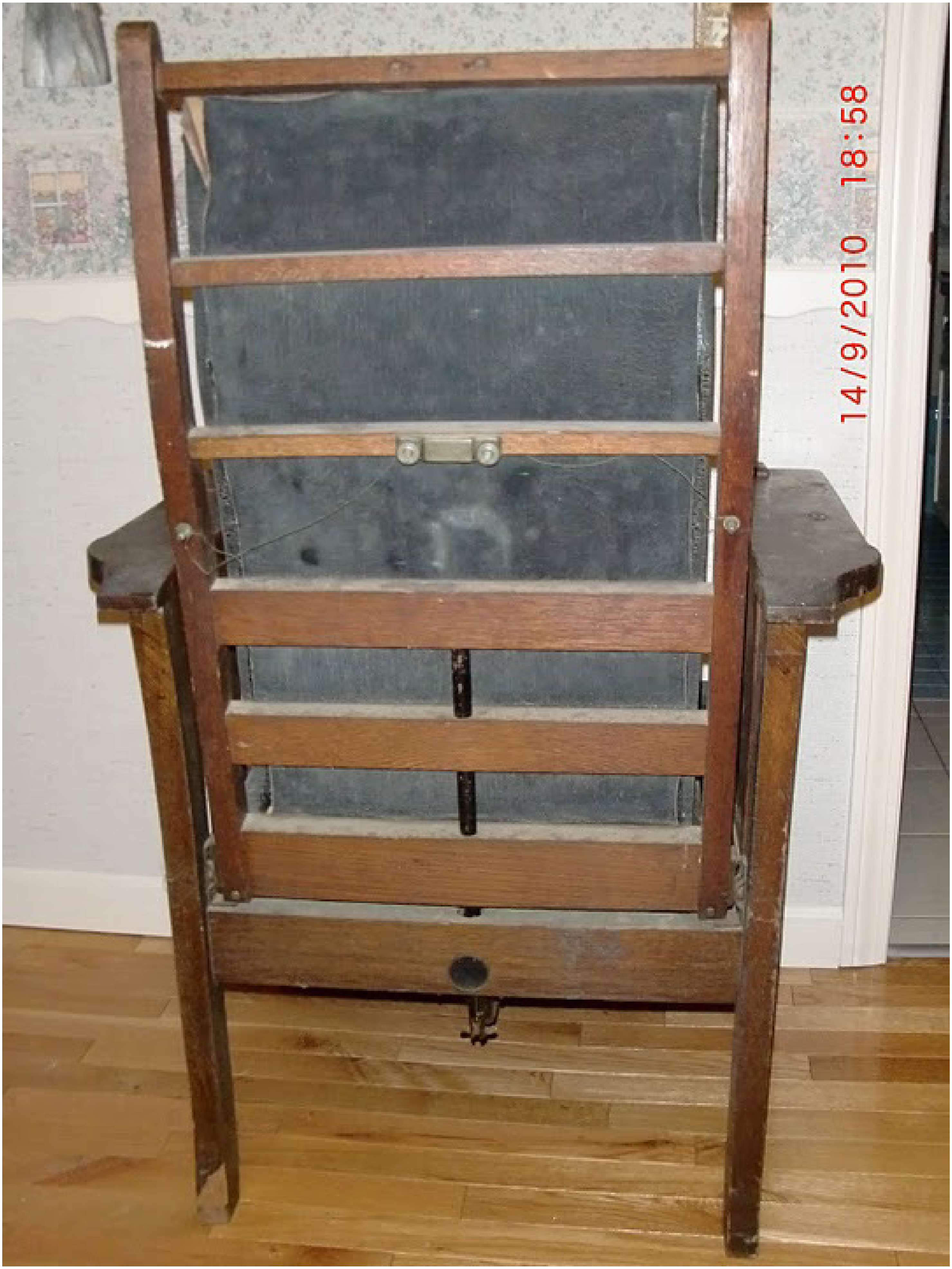
14/9/2010 18:57

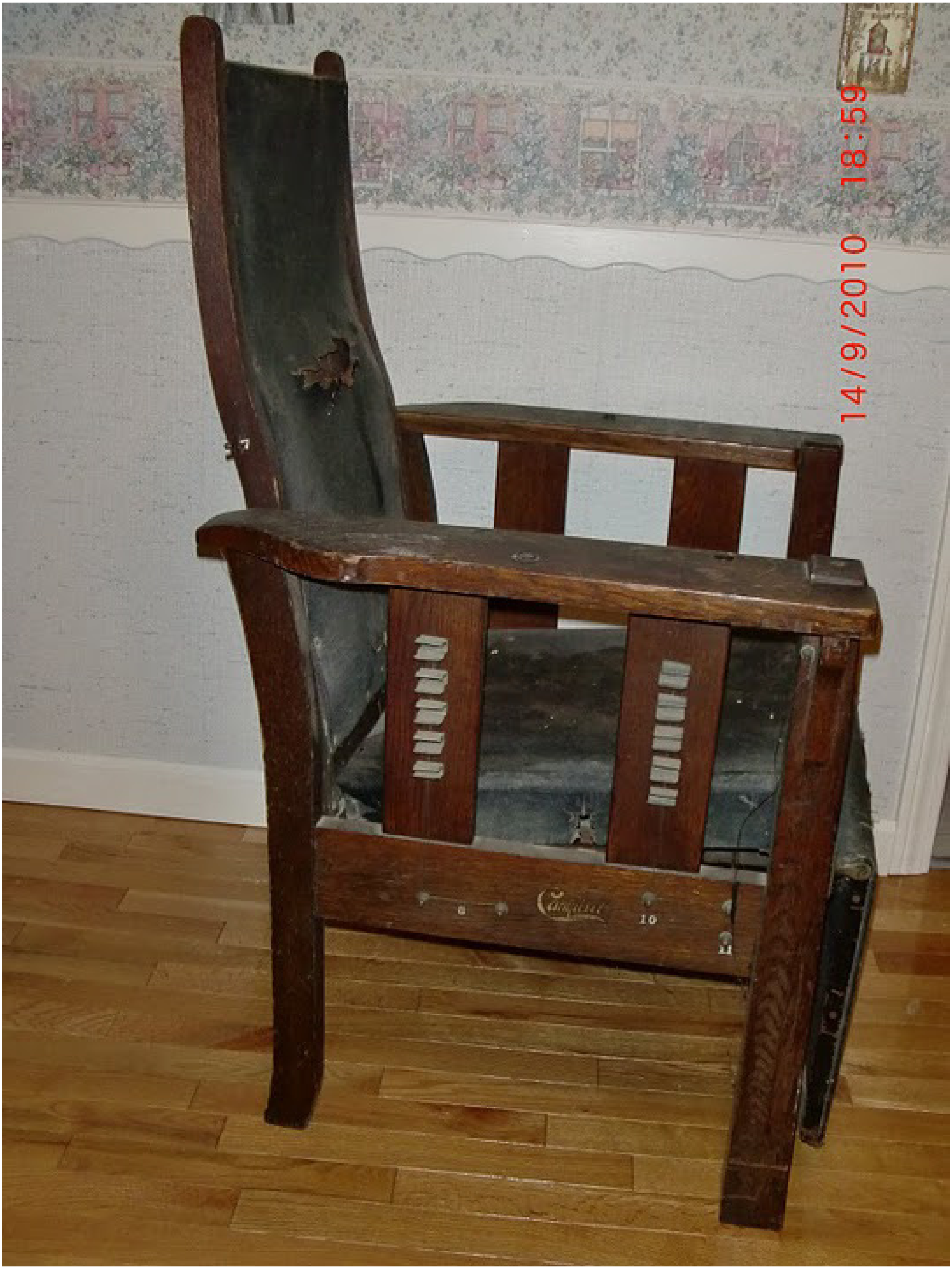
12
14/9/2010 18:58

3
2
5
14/9/2010 18:58



14/9/2010 18:58

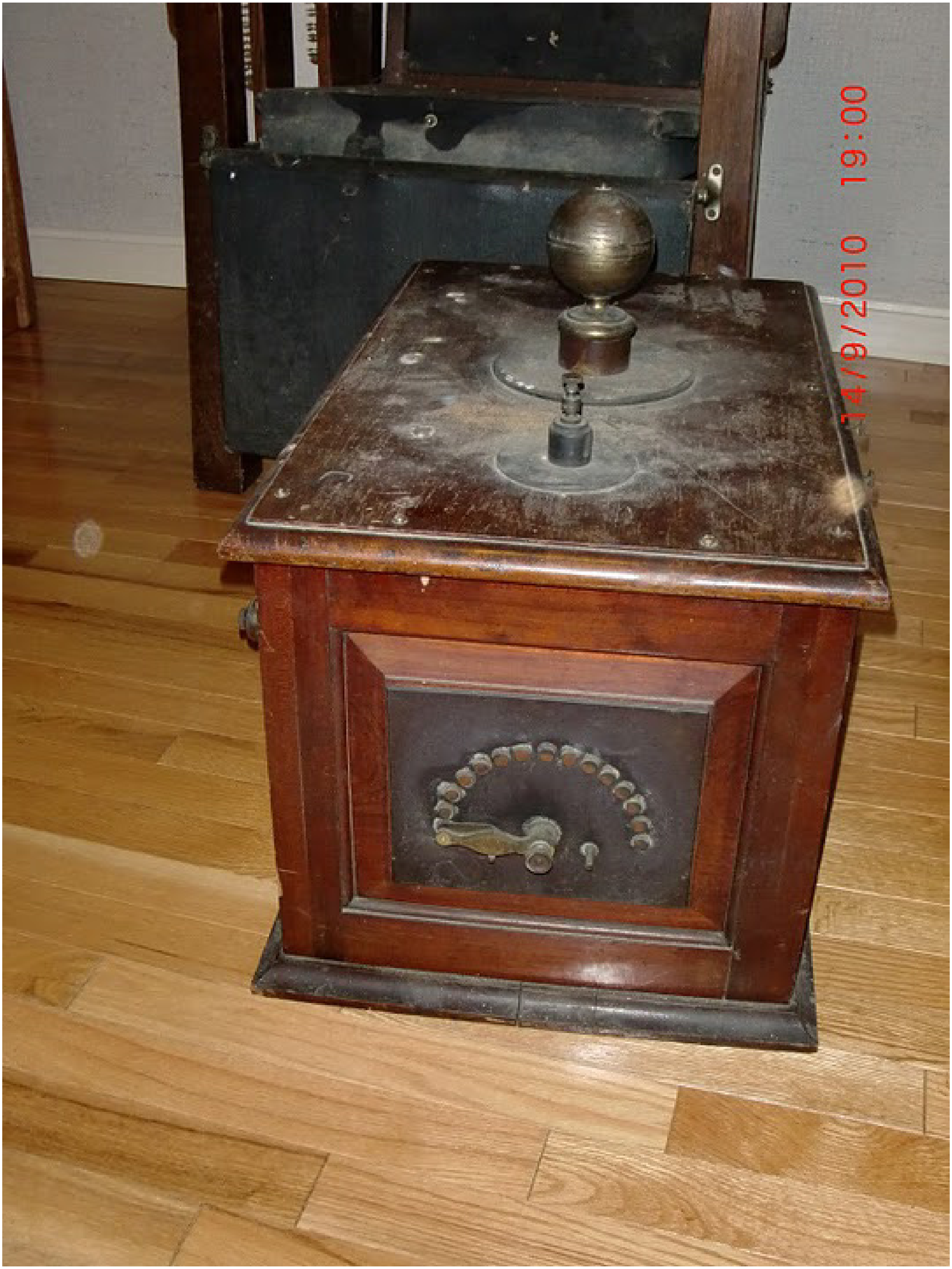

14/9/2010 18:58

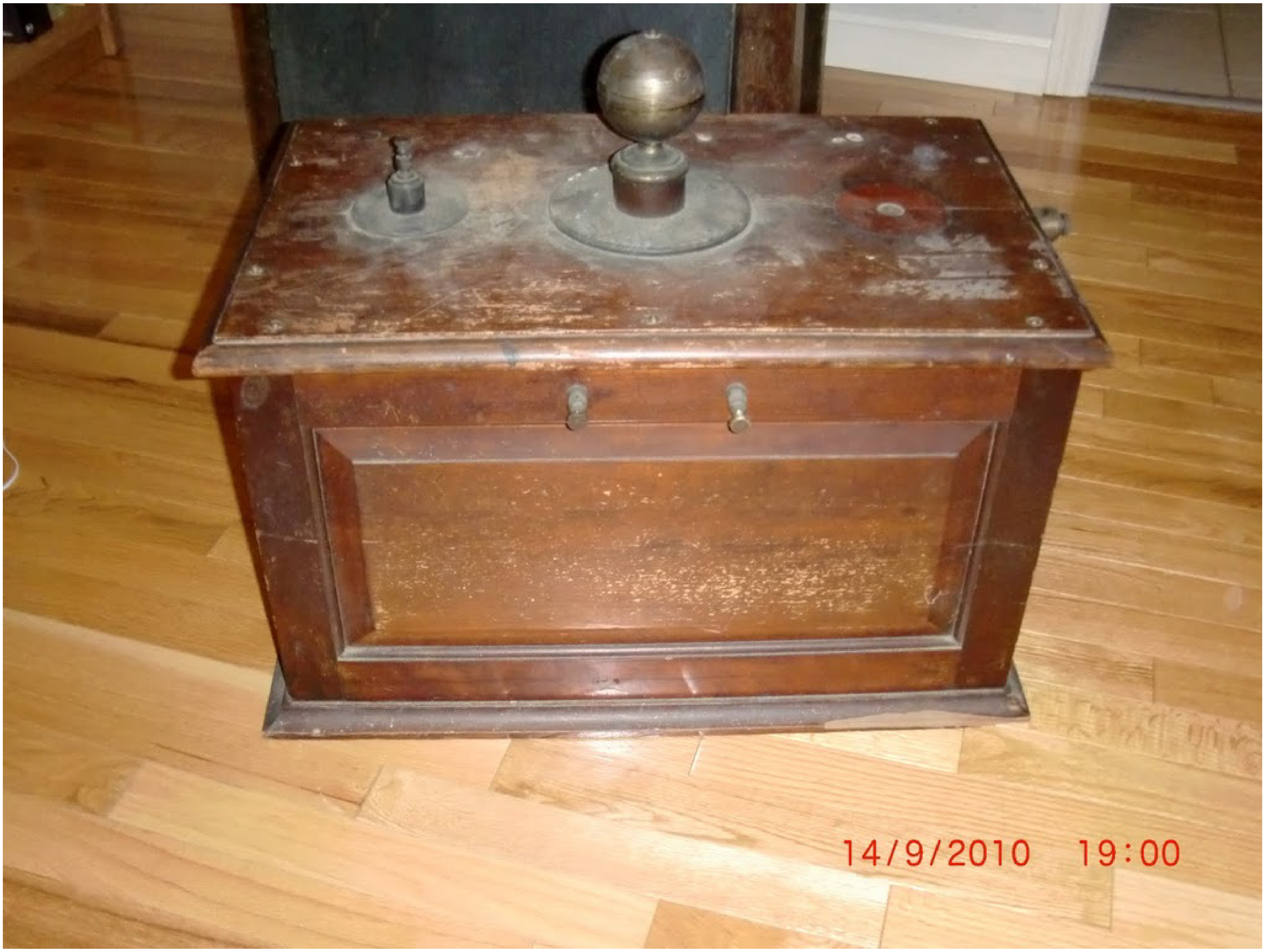


14/9/2010 18:59

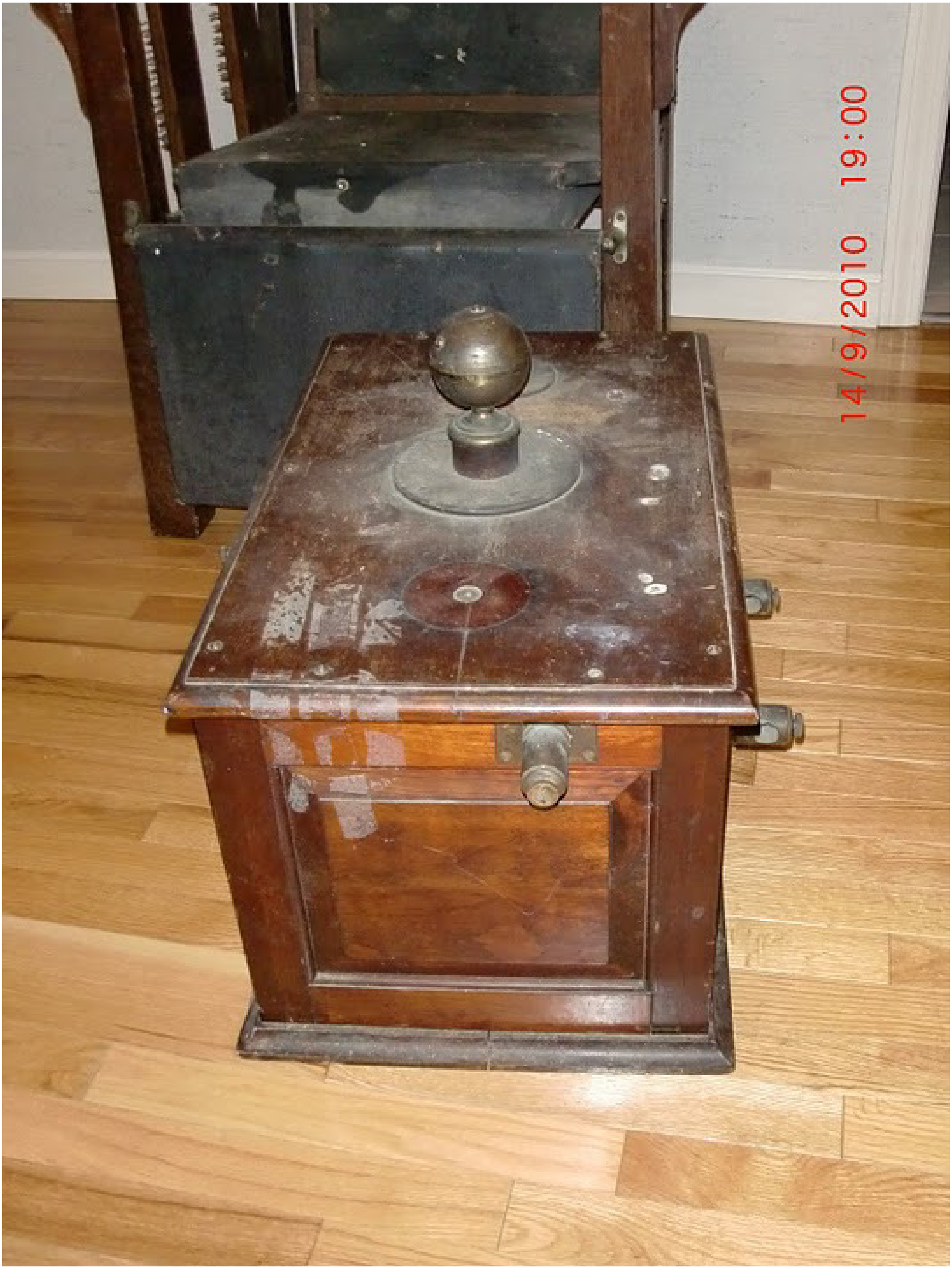
Campbell
8
10
14/9/2010 18:59

14/9/2010 19:00


14/9/2010 19:00

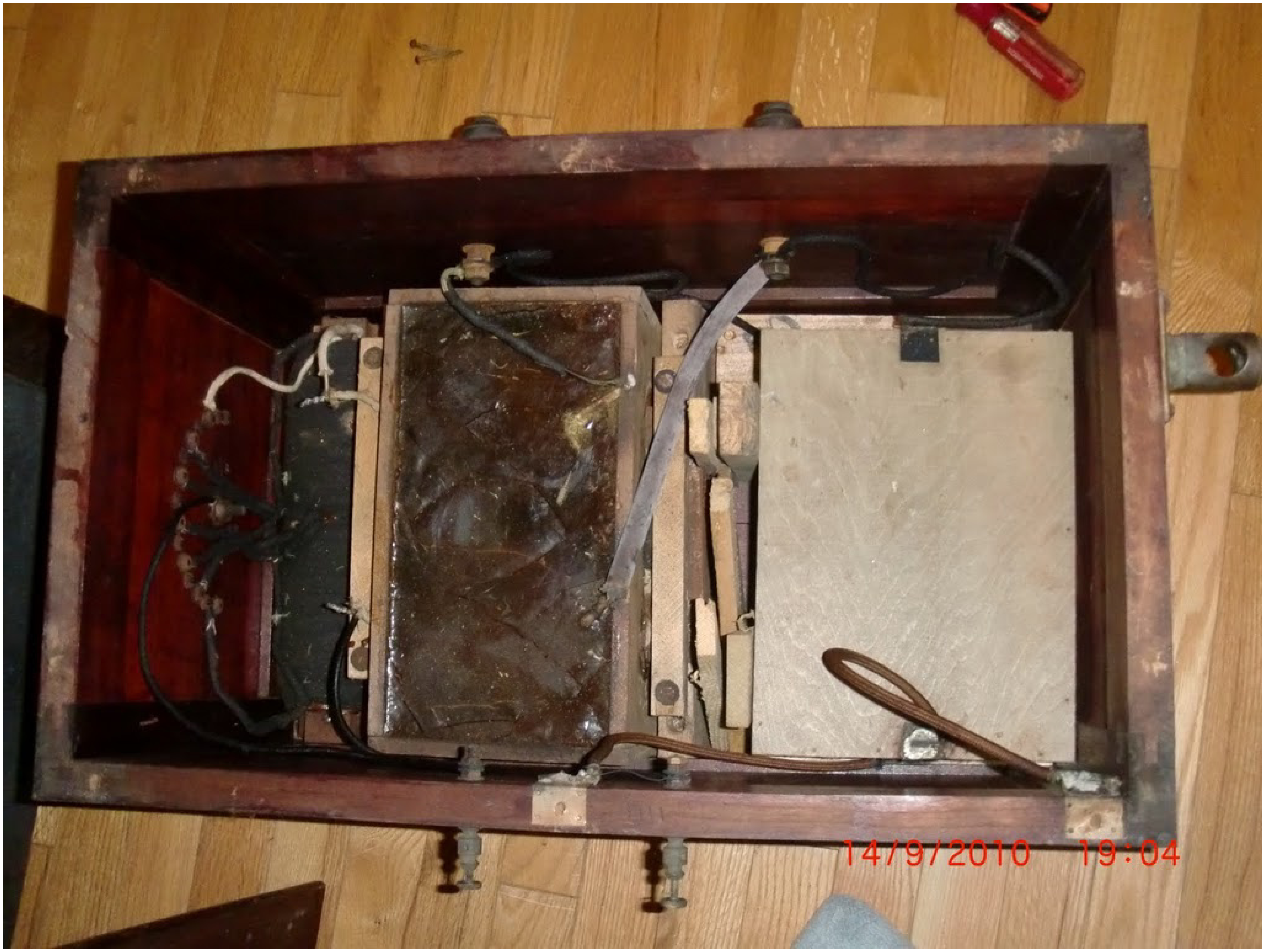


14/9/2010 19:00



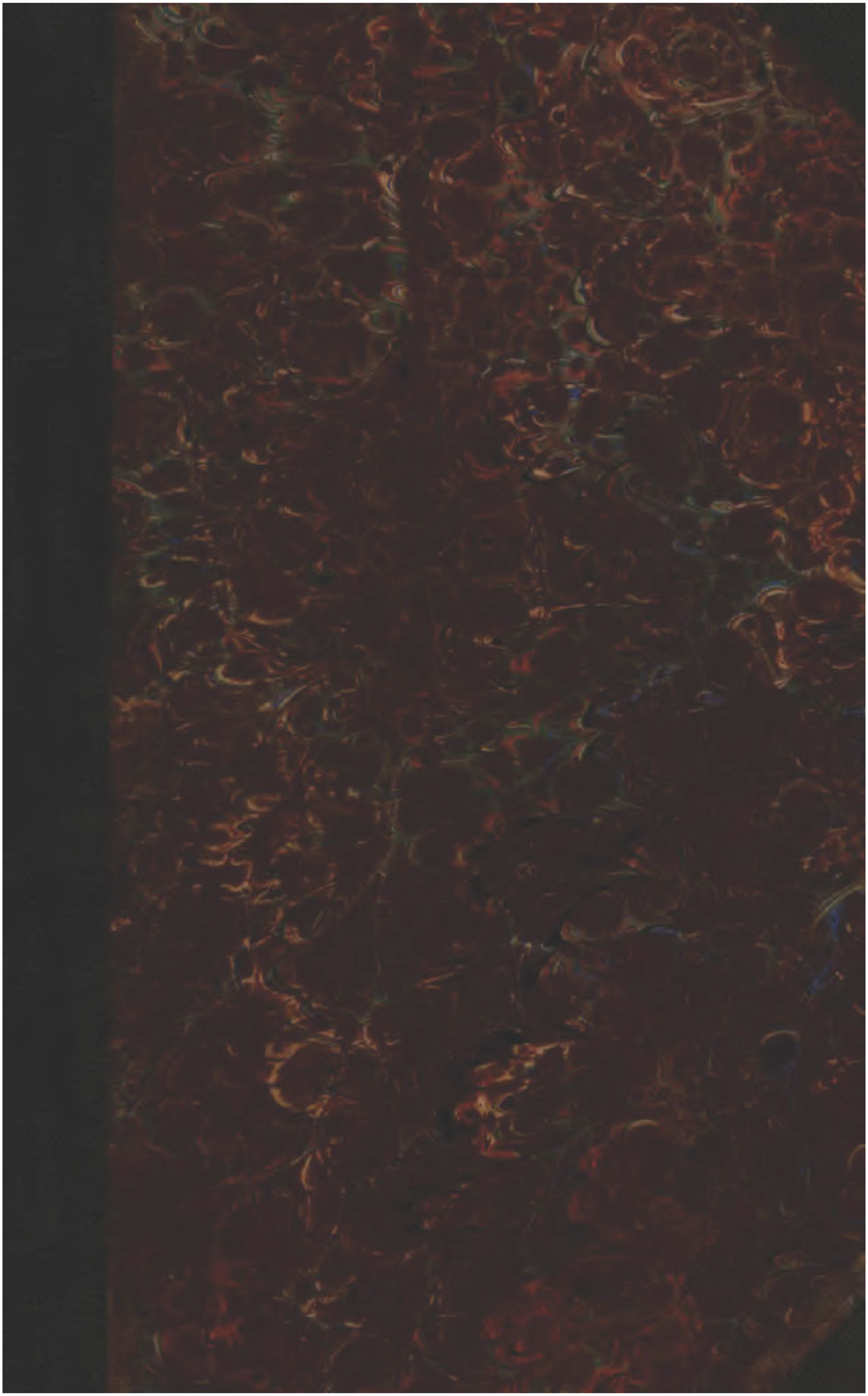
14/9/2010 19:00

14/9/2010 19:04



14/9/2010 19:04

14/9/2010 19:05



I can buy a high-frequency coil for from $25 to $75, why should I pay more?

Yes, so you can buy a steam engine for a dollar and up, but you would hardly expect to operate a power plant from one of the dollar variety. We have been all through this question of a cheap coil and have bought several in the open market for test and examination in our laboratory. A bright man says: "The more I see of some people, the better I like my dog." Our position is something like that. The more we see of the alleged small high-frequency coils the more we appreciate the superiority of our own product, and, while we are in business for the purpose of making a dollar, we believe that we can do this best by properly serving our customers, and we have not yet come to the place where we feel justified in offering an apparatus at a cheap price which we know will prove to be inadequate. A cheap coil is necessarily minus several important currents and parts. The current it does have is not powerful enough for satisfactory X-Ray.

After I buy a coil can I make satisfactory radiographs?

If you will give half the care and study to the matter that you would give to learning to operate an automobile—yes. Your COIL can do the work, and it is up to you to devote a little application and study to the subject of radiography if you expect to do first-class work. We make a standing offer to take any E Coil we ever made and with it produce a radiograph of any part of the body of an average adult in periods varying from two seconds for a wrist up to forty-five seconds for a hip.

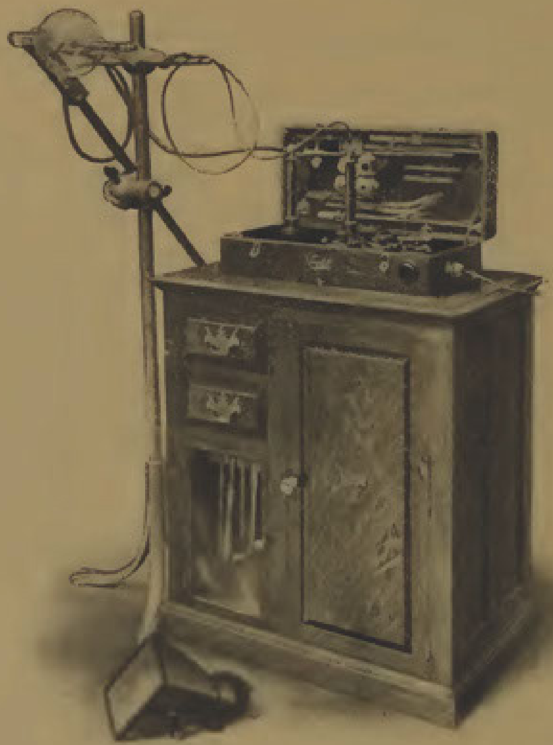
Can I successfully diagnose renal calculus?

Probably not. Out of the hundreds of men in the larger cities who are equipped with X-Ray coils it would not be a difficult matter to commit to memory the names of those who can do the more difficult and delicate work. This class of work is almost entirely a question of technique and experience. The matter of apparatus is a secondary consideration. Just as there are a few surgeons who are competent to undertake the more delicate and complicated operations, so it is with certain radiographic operations. Some of our customers have produced plates showing calculi, and you can do the same if you are willing to devote the necessary time and study to the acquirement of the necessary skill in technique. The possibilities for work with a Campbell Coil are far ahead of the requirements of the average purchaser, or of any work which he would be at all likely called upon to do.

OUTFIT NUMBER SIX

(See Page Two)

Will Give X-Ray—High Frequency—Cautery—D'Arsonval Sinusoidal—Thermo Faradic—Diagnostic Light



CAMPBELL MODEL "E" PORTABLE COIL WITH CABINET, ETC.

Furnished with Outfit Number Six (see also page 2)

Model "E" Coil complete same as shown on page 8 Cat. No. [illegible]	$180.00
Cabinet	30.00
Heavy Anode X-Ray Tube	18.00
Floor Tube Stand	10.00
Fluoroscope with P. B. C. Screen, 5x7	12.00
Set of six Vacuum Electrodes with handle	4.00
Outfit complete boxed ready for shipment (250 lbs.) Cat. No. [illegible]	**$254.00**

Our Number Six outfit is a most complete and beautiful piece of office equipment and in a few minutes it can by removal of coil from cabinet be converted into the most compact and efficient portable coil on the market.

Here is the ideal equipment. No physician's office is complete without it.

OUTFIT NUMBER FIVE

Same as Outfit Number Six except that cabinet is not included.

Outfit complete boxed ready for shipment (120 lbs.) . . . **$224.00**

Complete instructions furnished with each outfit for setting up and operating.

REG. U.S. PAT. OFF.

TRADE MARK

Campbell X-Ray and High-Frequency Apparatus

IS STANDARD OF
THE WORLD

IT HAS NO PEER

Manufactured by

Campbell Electric Company, Inc.

LYNN, MASSACHUSETTS, U.S.A.

Catalog No. 31 *October 1, 1911*

Copyrighted, 1911, by Campbell Electric Co.

MODEL "E" COIL

This coil is designed to operate from alternating circuits and is wound to accommodate the ordinary combinations of volts and cycles in commercial use.

The various currents which may be obtained are indicated in the cut on opposite page.

It may be operated from an ordinary electric lamp socket without special wiring, and is therefore available at the bedside of the patient as well as in the office of the doctor.

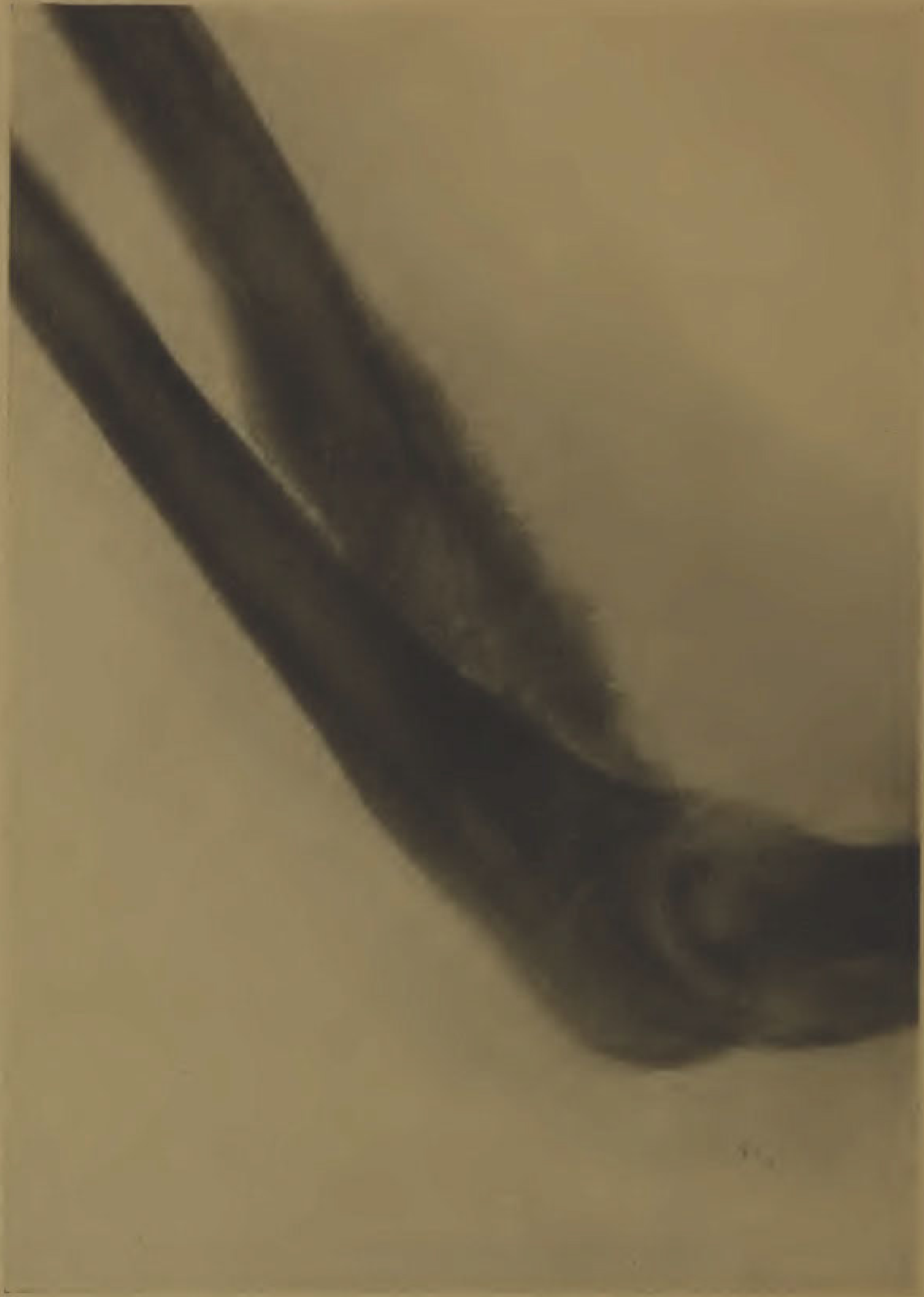
While it is compact and of moderate size it may be made into a more imposing piece of office furniture by being placed in the cabinet especially constructed for this purpose and illustrated under our special outfits.

We manufacture every part of the coil in our own factory, and every step is constantly under the supervision of an expert electrician. By means of improved machinery and methods of construction extreme accuracy and uniformity are obtained, and every part of the apparatus, from the hinges up, is so standardized and so accurately assembled that any portion of the coil is interchangeable with the same part of any other.

To meet the varying needs of the practitioner or the specialist we have arranged certain combinations into outfits, which we list on page 10.

The finish of our stock coil is golden oak but we can furnish any desired finish to match balance of office furniture at a *slight additional* charge.

To suit a limited demand we carry in stock cabinets and coils in solid mahogany which we can supply at an extra cost of $3 for coil case and $5 for cabinet.



"OSTEO-MYELITIS" UPPER THIRD OF ULNA. MADE WITH "CAMPBELL" MODEL "E" COIL

A SHORT CATECHISM FOR THE DOCTOR

What do I need of a coil? If you read many medical journals you cannot fail to notice the increasing space which is being given to treatment of diseases by the more modern forms of electricity — High Frequency Currents; also the reports concerning treatment and diagnosis by means of the X-Ray. If these methods are half that the writers claim for them you certainly have a number of patients who are entitled to the best. Shall they have it? If so, will you send them to one of the ever increasing number of specialists, or will you treat them yourself?

What is my legal responsibility in cases of fracture or possible fracture? It is your duty to use *reasonable skill* in diagnosis and treatment of all injuries, and at the present day *reasonable skill* in diagnosis cannot be claimed unless *advantage* is taken of the *opportunity* to examine by means of the X-RAY. More suits for malpractice are based upon alleged improper diagnosis or care of fracture cases than from any other cause. An X-Ray plate made at the time of injury may save you several thousand dollars, or if made by some one else several months after the case has left your hands, without such diagnosis on your part, may be the basis of a well grounded suit.

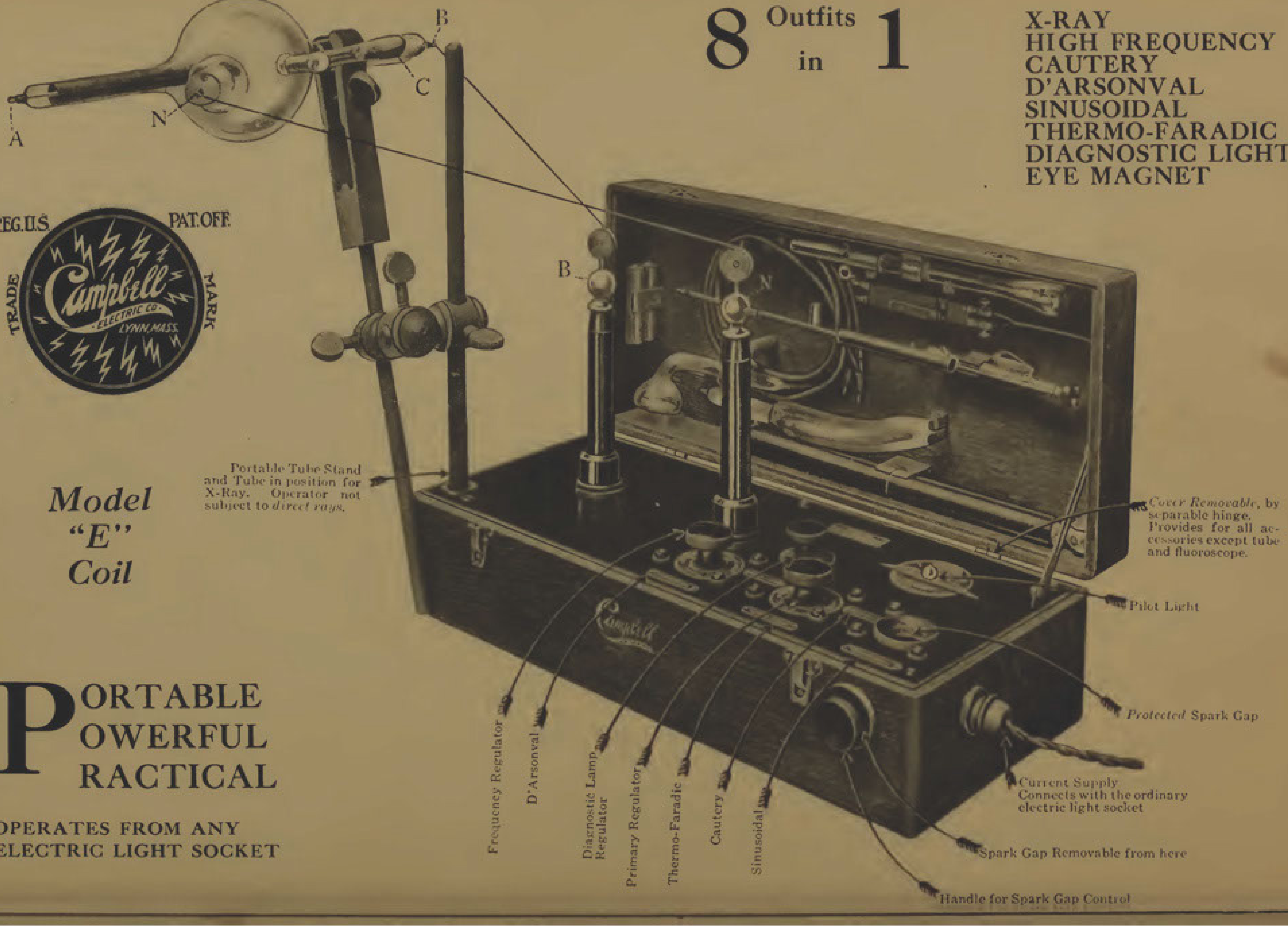
A Coil is an expensive article. Can I make it pay me? If you had a piece of real estate that was paying you ten per cent. clear, you would consider this a good investment. If you can, by means of the coil, earn only one dollar a week that you would not otherwise get, you are making a profit of over twenty per cent. on the cost of our Number Six Outfit, and there is practically no maintenance expense. The majority of Campbell Coil owners average $20 a week income from their coils, or over **400 per cent.** per annum on their investment, and many of them average $50 per week, or over **1000 per cent.** per annum on the investment. What better investment could you find than this? You are your own president, treasurer and board of directors in such an enterprise, and have all to do with the making and distribution of the dividends.

Yes, but can I use it successfully after I have bought it? Any man who can read and write and who is capable of turning on and off two switches can learn to operate a Campbell Coil and apply the various currents which it provides.

8 Outfits in 1

X-RAY
HIGH FREQUENCY
CAUTERY
D'ARSONVAL
SINUSOIDAL
THERMO-FARADIC
DIAGNOSTIC LIGHT
EYE MAGNET

REG. U.S. PAT. OFF.
TRADE MARK
Campbell Electric Co.
Lynn, Mass.


A
N
B
C
B
N
Portable Tube Stand and Tube in position for X-Ray. Operator not subject to *direct rays.*
Cover Removable, by separable hinge. Provides for all accessories except tube and fluoroscope.
Pilot Light
Protected Spark Gap
Current Supply Connects with the ordinary electric light socket
Spark Gap Removable from here
Handle for Spark Gap Control
Frequency Regulator
D'Arsonval
Diagnostic Lamp Regulator
Primary Regulator
Thermo-Faradic
Cautery
Sinusoidal
Campbell

Model "E" Coil

PORTABLE
POWERFUL
PRACTICAL

OPERATES FROM ANY
ELECTRIC LIGHT SOCKET

What can I get from the Campbell in the way of currents?

1. **High Frequency Currents**, to be applied with various vacuum electrodes, ranging from a soft and full discharge, which can be painlessly applied to the most sensitive parts of the body or in its cavities, up to a large volume of current at a lower frequency, capable of producing local stimulation up to the point of rubefaction, or even vessication.

2. **A D'Arsonval Current**, which is a true current of this type and which at the maximum *output* will run from *700* to *800* milliamperes, or even higher.

3. **A Thermo Faradic Current**, which is a true D'Arsonval current of a milder form, running from 200 to 400 m. a., and which, by actual test with a hot-wire meter registers as much as the D'Arsonval of larger apparatus, sold at a higher price than one of our complete outfits.

4. **A Sinusoidal Current** with a wide range of volume, and far in advance of similar currents produced by wall plate transformers.

5. **An X-Ray Current** sufficient for all needs, whether for therapeutic or diagnostic work, including radiographs of any part of the body.

6. **A Diagnostic Lamp Current** better and more reliable than that furnished by special outfits for this purpose, and which entirely does away with variation and annoyance incident to apparatus operated by batteries.

7. **A Cautery Current** of sufficient volume to operate any cautery instrument, and subject to control, so that it may be varied to produce dull red heat in a fine instrument or white heat in a heavy one.

8. **An Eye Magnet Current** capable of exciting a small eye-magnet to a lifting capacity of several ounces.

What is the guarantee given with your Coil?

The Campbell Coil is guaranteed against mechanical defect for a period of two years. Any disability arising from legitimate use will be repaired free of expense within that period, provided the coil or defective part is returned to our factory prepaid.

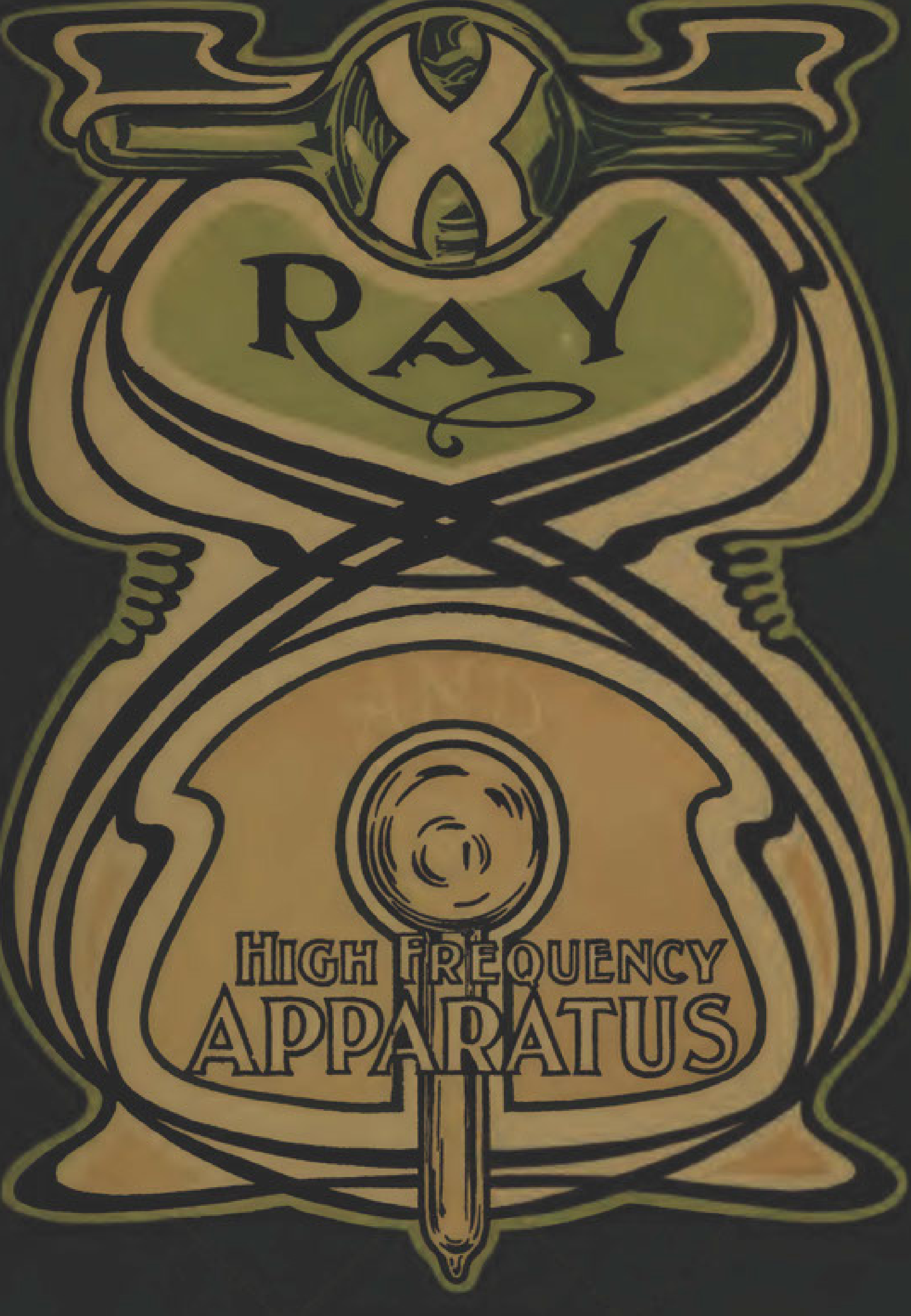
What are your prices and terms?

The prices are net as contained in this catalog, with a discount of 5 per cent. for cash. Prices include crating, F. O. B. Lynn or our nearest supply station.

Can I buy on easy terms, and at what rate?

Yes. If you are an established physician in good standing we will loan you the greater part of the amount necessary to buy any of our outfits, and you can pay us back in monthly payments. This gives you an opportunity to make your coil earn more than enough in the way of extra work to pay for itself. A number of doctors are buying in this way, as it saves them the necessity of paying out any large amount at one time. If you are interested in this plan we shall be glad to give you full particulars.

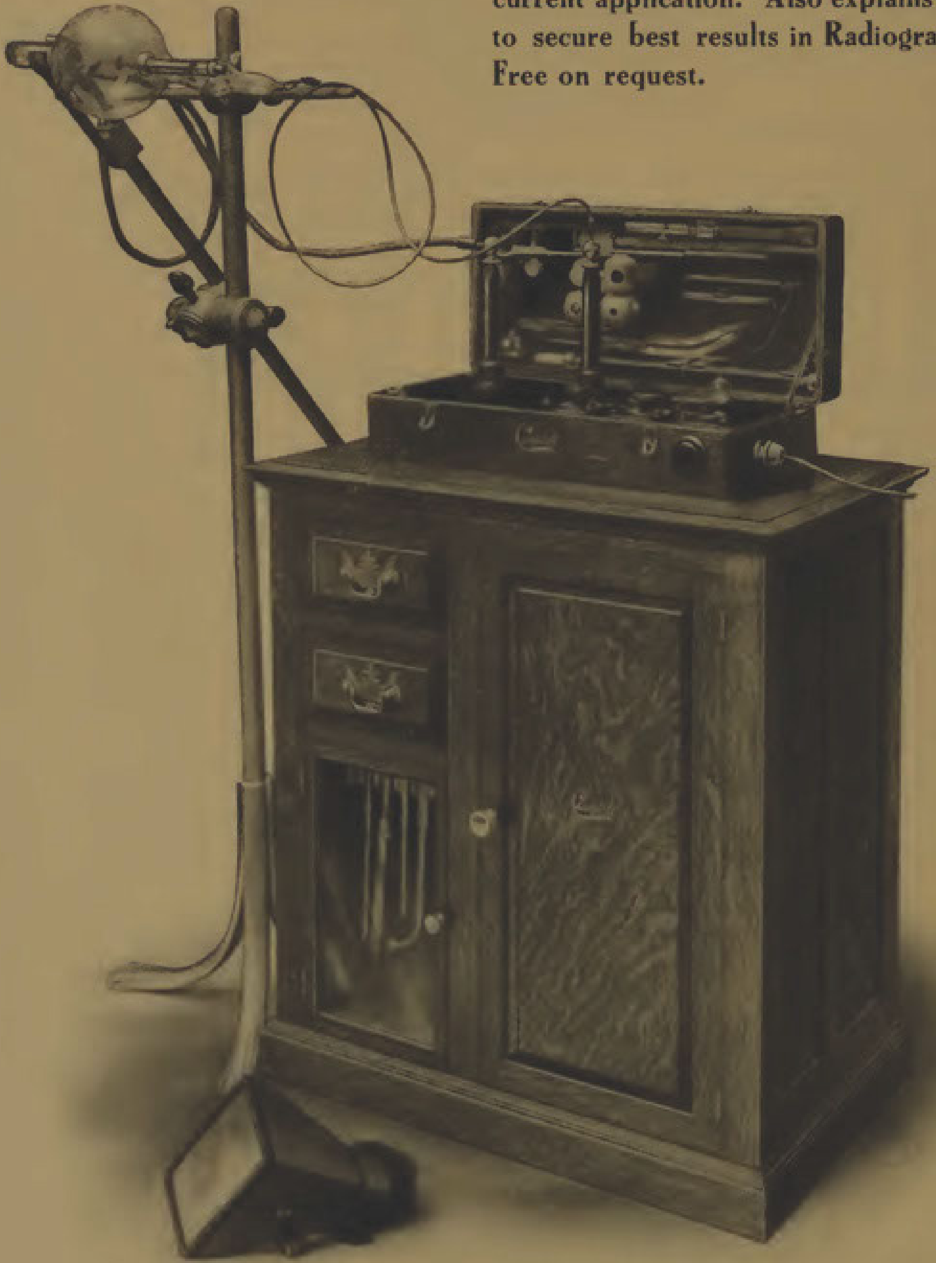
CAMPBELL



X RAY
AND
HIGH FREQUENCY APPARATUS

BOSTON MEDICAL LIBRARY
in the Francis A. Countway
Library of Medicine ~ *Boston*

TO show the wide field in which both the X-Ray and High Frequency currents have been employed with success, see our booklet entitled "Practical Electro-Therapeutics" which has been compiled from actual reports of cases. This booklet lists diseases alphabetically, with suggestions for proper methods of current application. Also explains how to secure best results in Radiography. Free on request.



MODERN OFFICE EQUIPMENT
OUTFIT NUMBER SIX
See Page 10

INTRODUCTORY

High - Frequency Currents adopted as a standard method of treatment, and gives results where drugs fail.

Medical literature of the present day is so full of mention concerning the use of high-frequency currents in the treatment of disease that it is superfluous to use space in attempting to set forth their value. That they are being used more and more, even by the general practitioner, almost any medical publication will certify, and there is an extensive and well defined field in which it is proving of estimable value.

X-Ray diagnosis has revolutionized management of fracture cases.

Diagnosis by the X-Ray has revolutionized the management of fracture cases and has rendered possible a prompt and accurate recognition of abnormal conditions of the bony structure, and its use in the diagnosis of certain diseases is becoming more and more general. As technique improves, this field of work is becoming still more extensive.

High - Frequency Coil the most practical type of apparatus

The early and general use of the static machine has gradually given place to the more reliable and powerful coil, and among coils there has been a growing tendency to select those of the high-frequency type. With this type of coil the various therapeutic currents may be produced direct without the aid of cumbersome accessory apparatus, and recent improvements in construction have made it available for every class of radiographic work.

Campbell coil best suited to needs of the physician.

From the beginning of its manufacture special attention has been given to the development of the Campbell Coil as an X-Ray apparatus, and while at the same time the variety and quality of the high-frequency currents has been steadily increased, its capabilities as a producer of X-Rays have also been developed to the point where it will make the best of radiographs of any part of the human body, and with a minimum outlay of preparatory work. To the physician who is particularly interested in this class of work we shall be glad to send full particulars, together with samples of work done in the ordinary routine of general practice.

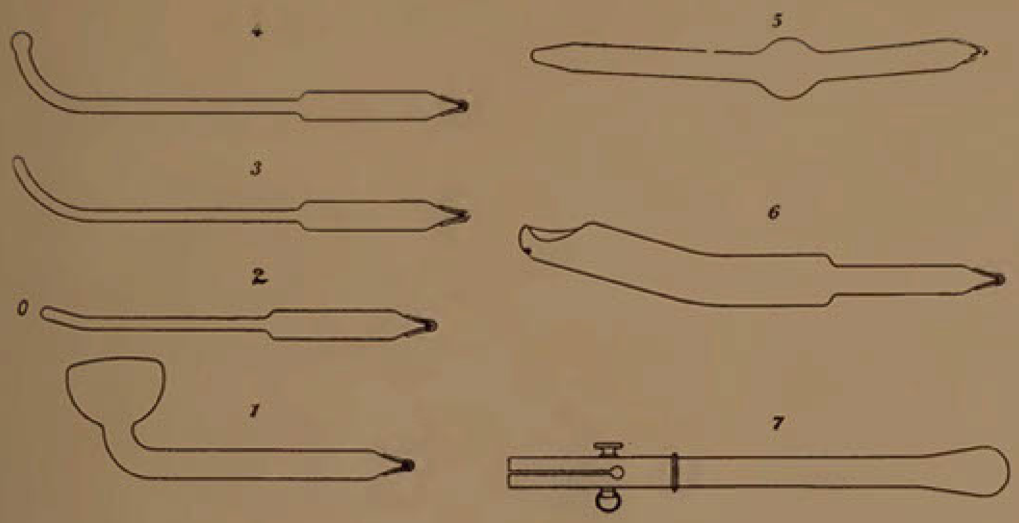
Campbell Electric Company interest does NOT cease with the sale.

The large number of Campbell outfits (about 2,500 at this writing) now in use not only makes it advisable, but also makes it possible, for the Campbell Electric Company to maintain a department for collection and exchange of valuable information relative to securing best results with electric apparatus. This department is in charge of a practical physician who has made electro therapy and radiography a specialty for the past ten years. The service is freely at the disposal of our customers and has demonstrated itself to be of value to the customer equal to the apparatus itself—but costs him nothing.

In concluding we wish to assure you that should you purchase a Campbell outfit we will endeavor that you never have cause to regret your purchase.

CAMPBELL ELECTRIC CO., Inc.

ELECTRODES

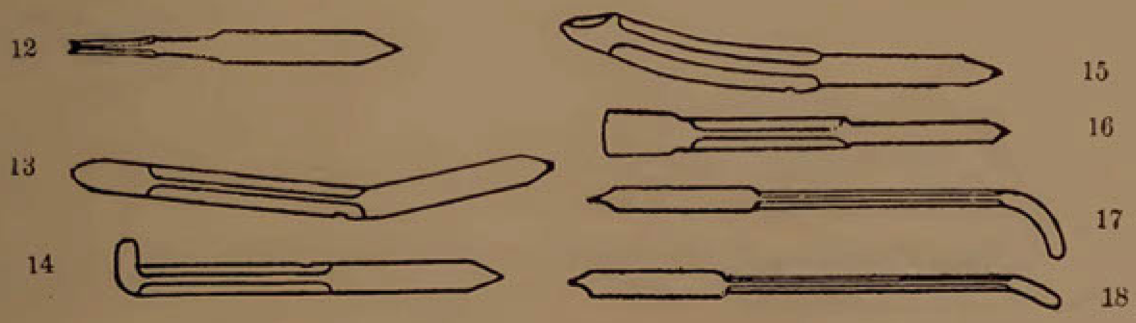


1—Surface 2—Nasal 3—Urethral 4—Throat
6—Rectal 7—Vaginal 7—Handle

A special feature of our electrode sets is our Universal Handle. This handle is provided with a large swivel ring for attachment of the cord from the coil and by means of the thumb-nut opposite combined with the peculiar construction of the metal collar, more perfect contact with the electrode, and more rigidity in handle is accomplished than with any device heretofore designed for holding electrodes.

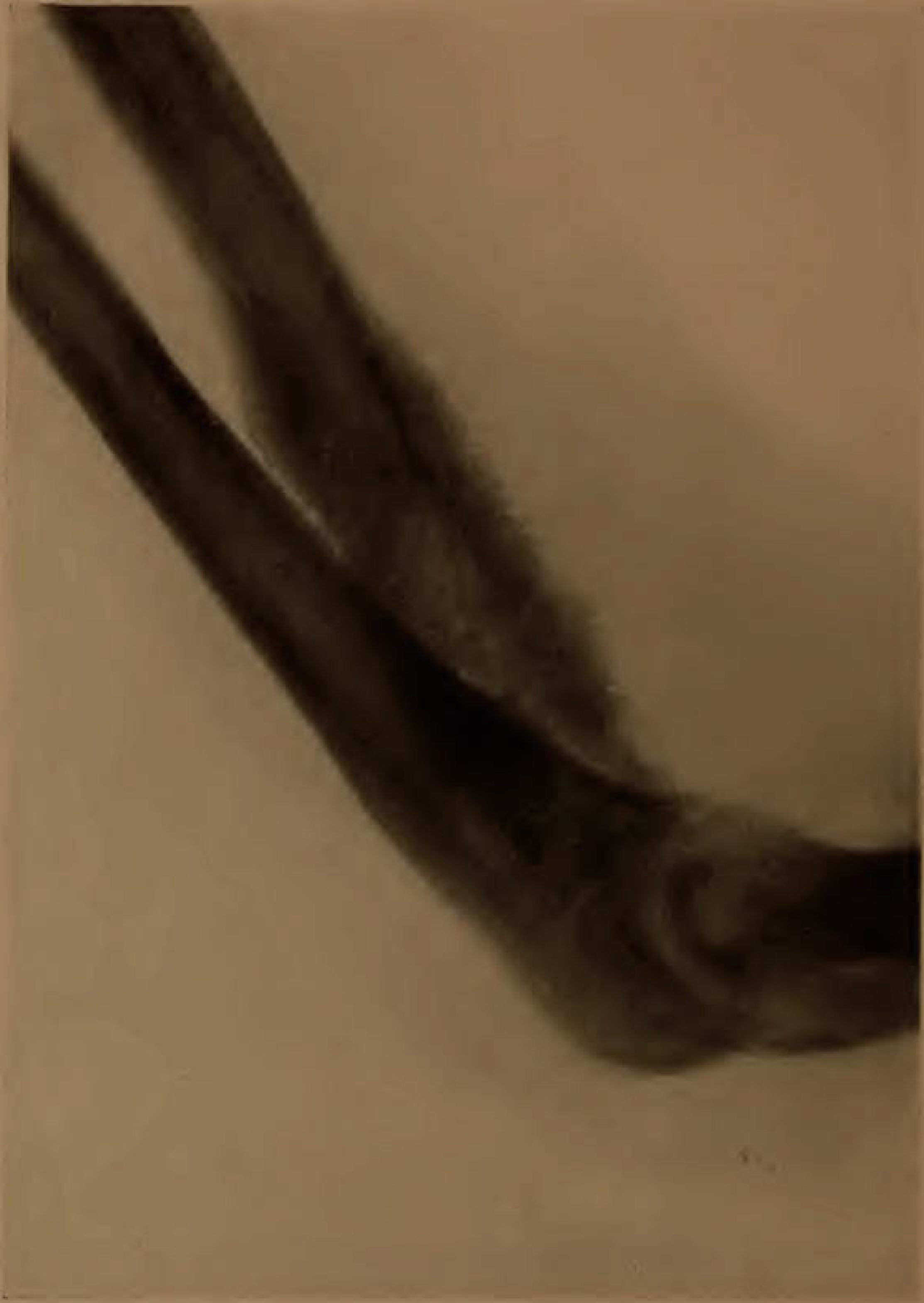
Prices, Complete set of Electrodes, with handle, $4.00. Single Electrodes, 75 cents
Handle, 75 cents.

INSULATED ELECTRODES

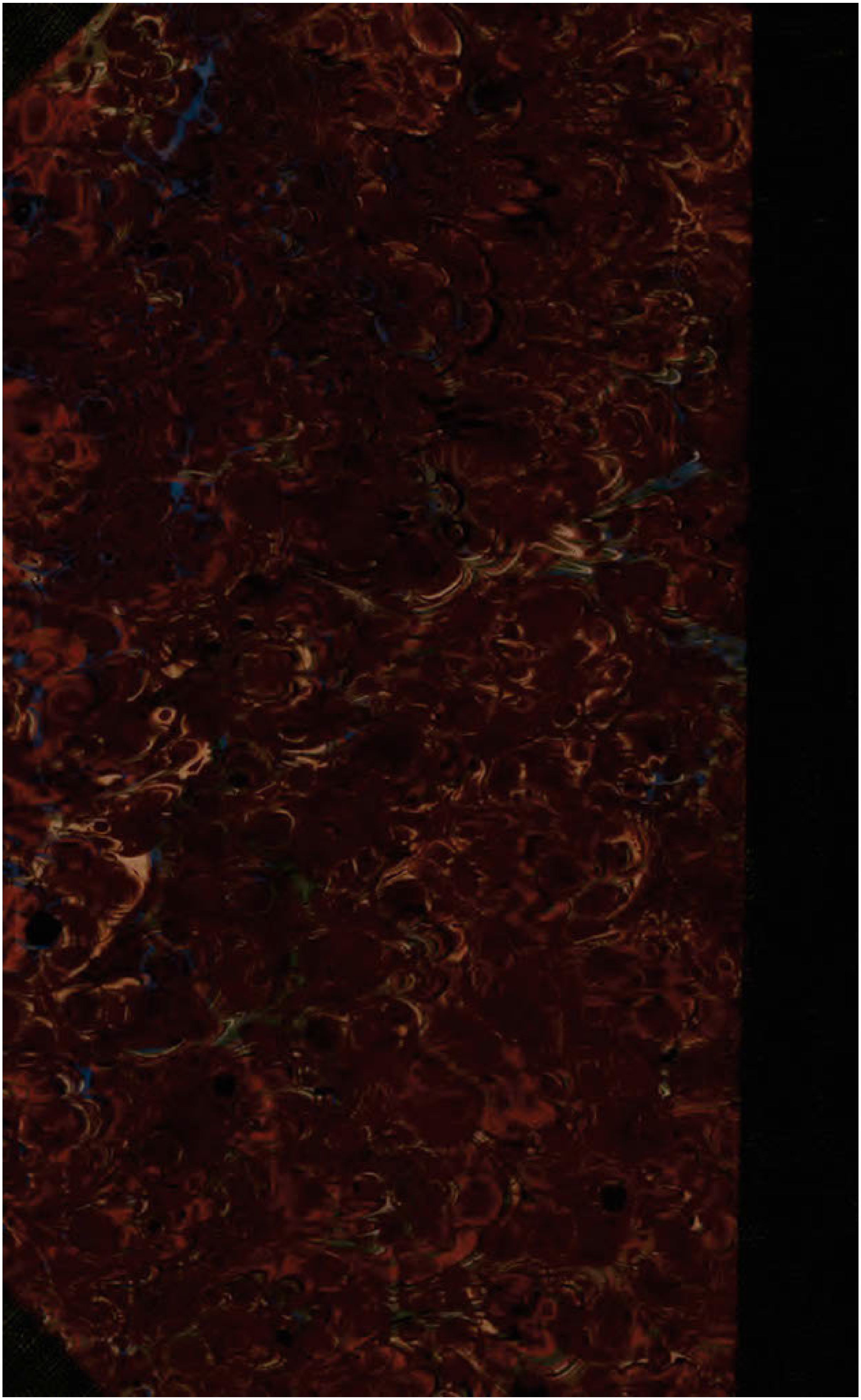


12—Ear 13—Rectal 14—Post Nasal 15—Vaginal
16—Tongue 17—Urethral 18—Nasal

By the use of insulated electrodes the current may be more accurately localized—a most important consideration in cavity work. Price $1.50 each.



"OSTEO-MYELITIS" UPPER THIRD OF ULNA. MADE WITH "CAMPBELL" MODEL "E" COIL



PENETROMETER

Within the large circle of the penetrometer are twelve smaller circles, arranged clockwise. These circular openings are filled with material which cuts off the X-Ray in varying degrees. On the outside of the penetrometer is a clock hand and by observing through the fluoroscope the last circle through which the clock hand is visible the degree of penetration in any tube may be estimated.

Two to four degrees of penetration are best adapted to therapeutic work where medium or low tube is indicated. Four to six degrees are best adapted to radiographic work and a penetration of eight degrees is sufficient for deep work.

The photographic plate is more sensitive than the eye and the exact penetration of a tube may be determined by placing the penetrometer on the plate on which exposure is made, being careful that it does not come under part exposed, and noting the number of circles which appear on the developed plate. Price $5.00.

EYE MAGNET

At the request of a number of our customers among the Oculists we have added this accessory which may be used on the Cautery Circuit. It has ample lifting capacity and its usefulness will appeal to any physician who is called upon to remove steel chips from the eyes. Price $3.50

ROTARY CONVERTER

We find that when operating a high frequency coil on direct current a much smoother and better quality of current output is obtained by the use of a rotary converter of the design that we regularly furnish with our outfits. This converter may also be used as a motor.
Price (110 volts), $35.00.

A SHORT CATECHISM FOR THE DOCTOR

What do I need of a coil?

If you read many medical journals you cannot fail to notice the increasing space which is being given to treatment of diseases by the more modern forms of electricity — High Frequency Currents; also the reports concerning treatment and diagnosis by means of the X-Ray. If these methods are half that the writers claim for them you certainly have a number of patients who are entitled to the best. Shall they have it? If so, will you send them to one of the ever increasing number of specialists, or will you treat them yourself?

What is my legal responsibility in cases of fracture or possible fracture?

It is your duty to use *reasonable skill* in diagnosis and treatment of all injuries, and at the present day *reasonable skill* in diagnosis cannot be claimed unless *advantage* is taken of the *opportunity* to examine by means of the X-RAY. More suits for malpractice are based upon alleged improper diagnosis or care of fracture cases than from any other cause. An X-Ray plate made at the time of injury may save you several thousand dollars, or if made by some one else several months after the case has left your hands, without such diagnosis on your part, may be the basis of a well grounded suit.

A Coil is an expensive article. Can I make it pay me?

If you had a piece of real estate that was paying you ten per cent. clear, you would consider this a good investment. If you can, by means of the coil, earn only one dollar a week that you would not otherwise get, you are making a profit of over twenty per cent. on the cost of our Number Six Outfit, and there is practically no maintenance expense. The majority of Campbell Coil owners average $20 a week income from their coils, or over **400 per cent.** per annum on their investment, and many of them average $50 per week, or over **1000 per cent.** per annum on the investment. What better investment could you find than this? You are your own president, treasurer and board of directors in such an enterprise, and have all to do with the making and distribution of the dividends.

Yes, but can I use it successfully after I have bought it?

Any man who can read and write and who is capable of turning on and off two switches can learn to operate a Campbell Coil and apply the various currents which it provides.

I can buy a high-frequency coil for from $25 to $75, why should I pay more?

Yes, so you can buy a steam engine for a dollar and up, but you would hardly expect to operate a power plant from one of the dollar variety. We have been all through this question of a cheap coil and have bought several in the open market for test and examination in our laboratory. A bright man says: "The more I see of some people, the better I like my dog." Our position is something like that. The more we see of the alleged small high-frequency coils the more we appreciate the superiority of our own product, and, while we are in business for the purpose of making a dollar, we believe that we can do this best by properly serving our customers, and we have not yet come to the place where we feel justified in offering an apparatus at a cheap price which we know will prove to be inadequate. A cheap coil is necessarily minus several important currents and parts. The current it does have is not powerful enough for satisfactory X-Ray.

After I buy a coil can I make satisfactory radiographs?

If you will give half the care and study to the matter that you would give to learning to operate an automobile—yes. Your COIL can do the work, and it is up to you to devote a little application and study to the subject of radiography if you expect to do first-class work. We make a standing offer to take any E Coil we ever made and with it produce a radiograph of any part of the body of an average adult in periods varying from two seconds for a wrist up to forty-five seconds for a hip.

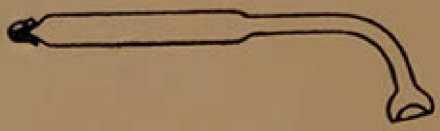
Can I successfully diagnose renal calculus?

Probably not. Out of the hundreds of men in the larger cities who are equipped with X-Ray coils it would not be a difficult matter to commit to memory the names of those who can do the more difficult and delicate work. This class of work is almost entirely a question of technique and experience. The matter of apparatus is a secondary consideration. Just as there are a few surgeons who are competent to undertake the more delicate and complicated operations, so it is with certain radiographic operations. Some of our customers have produced plates showing calculi, and you can do the same if you are willing to devote the necessary time and study to the acquirement of the necessary skill in technique. The possibilities for work with a Campbell Coil are far ahead of the requirements of the average purchaser, or of any work which he would be at all likely called upon to do.

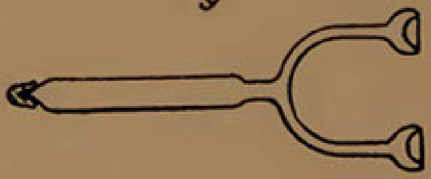
COUNTWAY LIBRARY OF MEDICINE
RC
78.5
C15

SPECIAL ELECTRODES

8

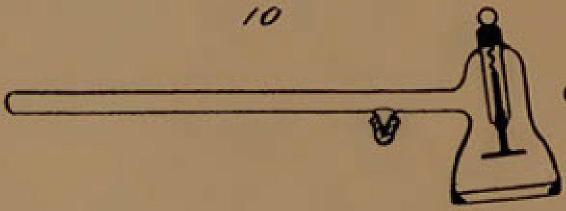


9



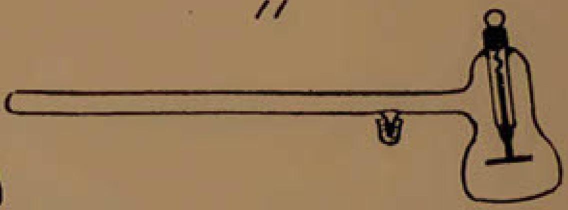
Single Eye Electrode	$ .75
Double Eye Electrode	1.50

10



Cataphoric Electrode . **$3.00**

11



Localizing Surface Electrode, **$3.00**

FULGERATION ELECTRODE

This electrode is intended for the removal of warts, moles, naevi and similar growths by the local application of a spark. It consists of a metal pointed electrode which is connected directly with the high-frequency terminal of the coil. The electrode is protected by a glass sleeve which enables accurate localization and rapid withdrawal when sufficient spark has been applied. **Price $2.50.**

We are prepared at short notice to manufacture electrodes of special size or design from drawings or from specifications and in quantities from one to a hundred or more. Prices will be submitted upon receipt of sketch or specification.

REG. U.S. PAT. OFF.
TRADE MARK

Campbell X-Ray and High-Frequency Apparatus

IS STANDARD OF THE WORLD

IT HAS NO PEER

Manufactured by

Campbell Electric Company, Inc.

LYNN, MASSACHUSETTS, U.S.A.

Catalog No. 31 Copyrighted, 1911, by Campbell Electric Co. *October 1, 1911*

POINTS TO BE REMEMBERED WHEN ORDERING

Some form of electric lighting service is necessary with the Campbell Coil. IT DOES NOT OPERATE ITSELF nor is it run by batteries.

The majority of power plants now provide alternating current of 104 to 110 volts and 60 cycles. Our stock coil is therefore built for this current and unless otherwise specified this type will be sent. Where voltage or cycles are different please specify as we wind specially to meet these variations without extra charge.

Where only direct current is available it is necessary to install a rotary converter in addition to the outfit in order that a true alternating current may be supplied to the coil. (See page 20.)

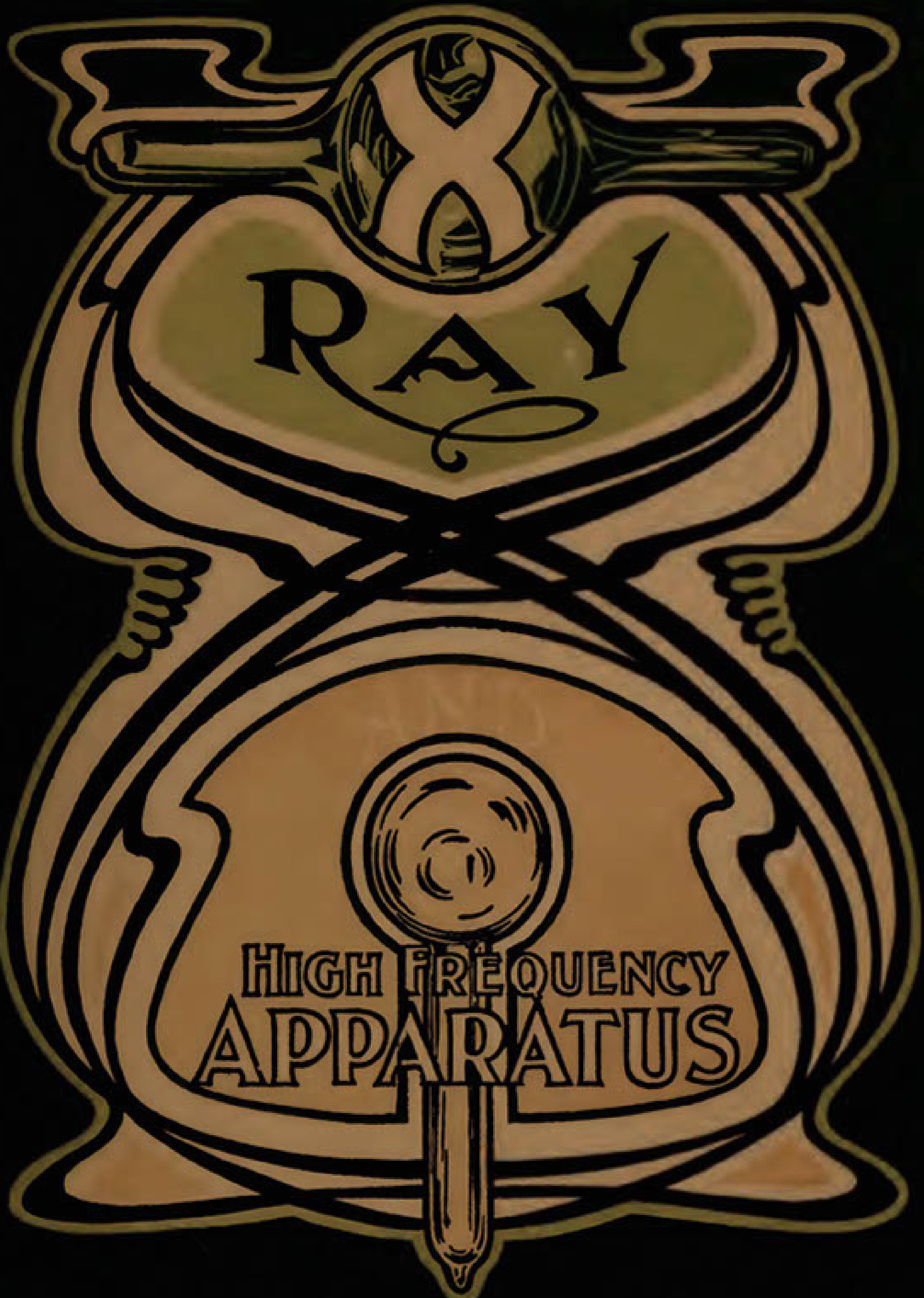
When ordering or inquiring state whether your current is direct or alternating, give voltage and if alternating give number of cycles.

Every coil is provided with a connecting cord and plug and as soon as this is connected with a convenient lighting socket the coil is ready for work without any additional wiring or connections.

Every coil is accompanied by minute directions for operating and all currents and connections may be easily learned from instruction book alone.

Prices are F. O. B. Lynn or nearest supply point and include careful packing.

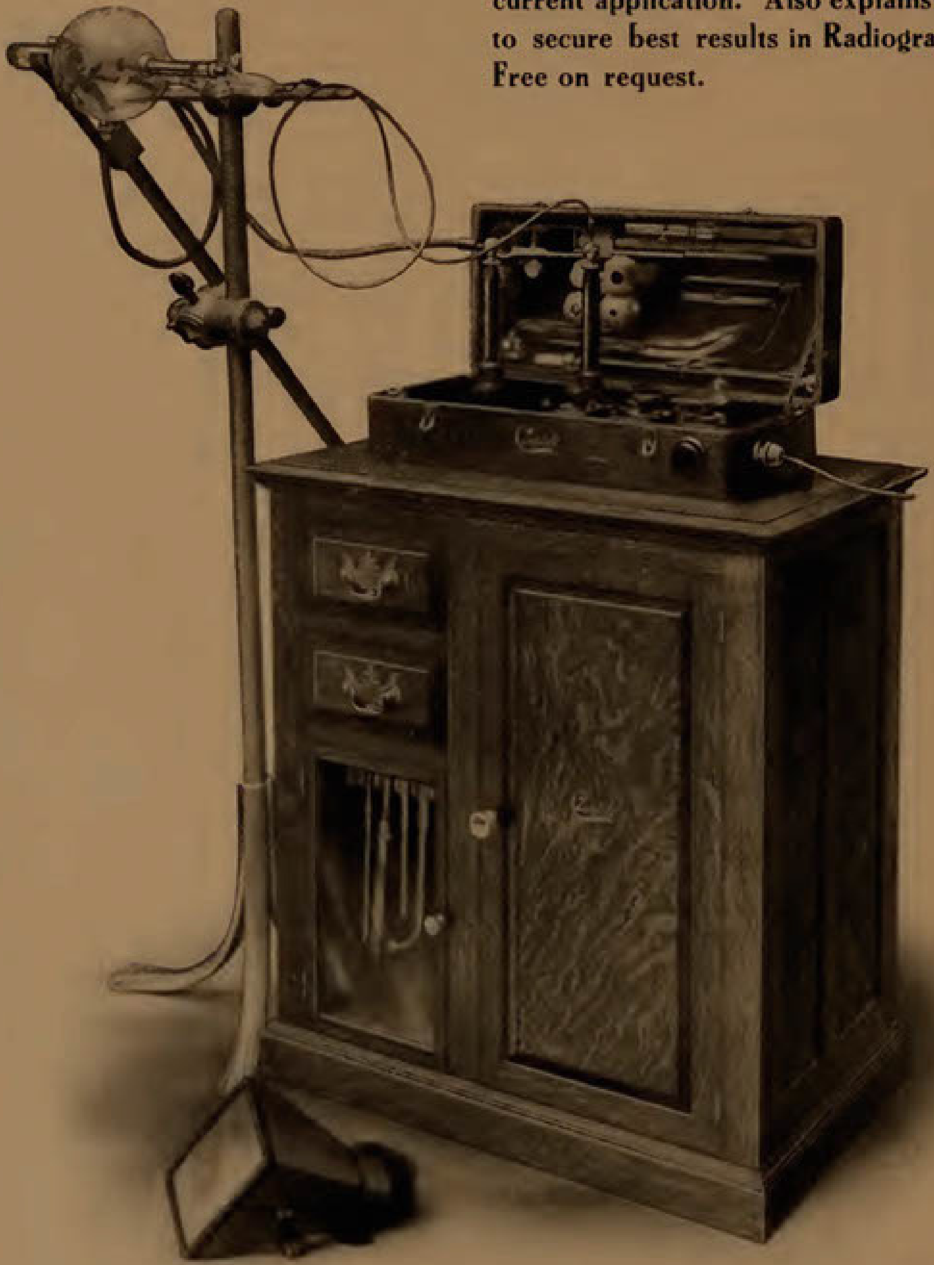
Terms are 5% discount from catologue prices for cash. Where it is desired to purchase on part payment full particulars will be furnished on application.



X RAY

HIGH FREQUENCY APPARATUS

TO show the wide field in which both the X-Ray and High Frequency currents have been employed with success, see our booklet entitled "Practical Electro-Therapeutics" which has been compiled from actual reports of cases. This booklet lists diseases alphabetically, with suggestions for proper methods of current application. Also explains how to secure best results in Radiography. Free on request.



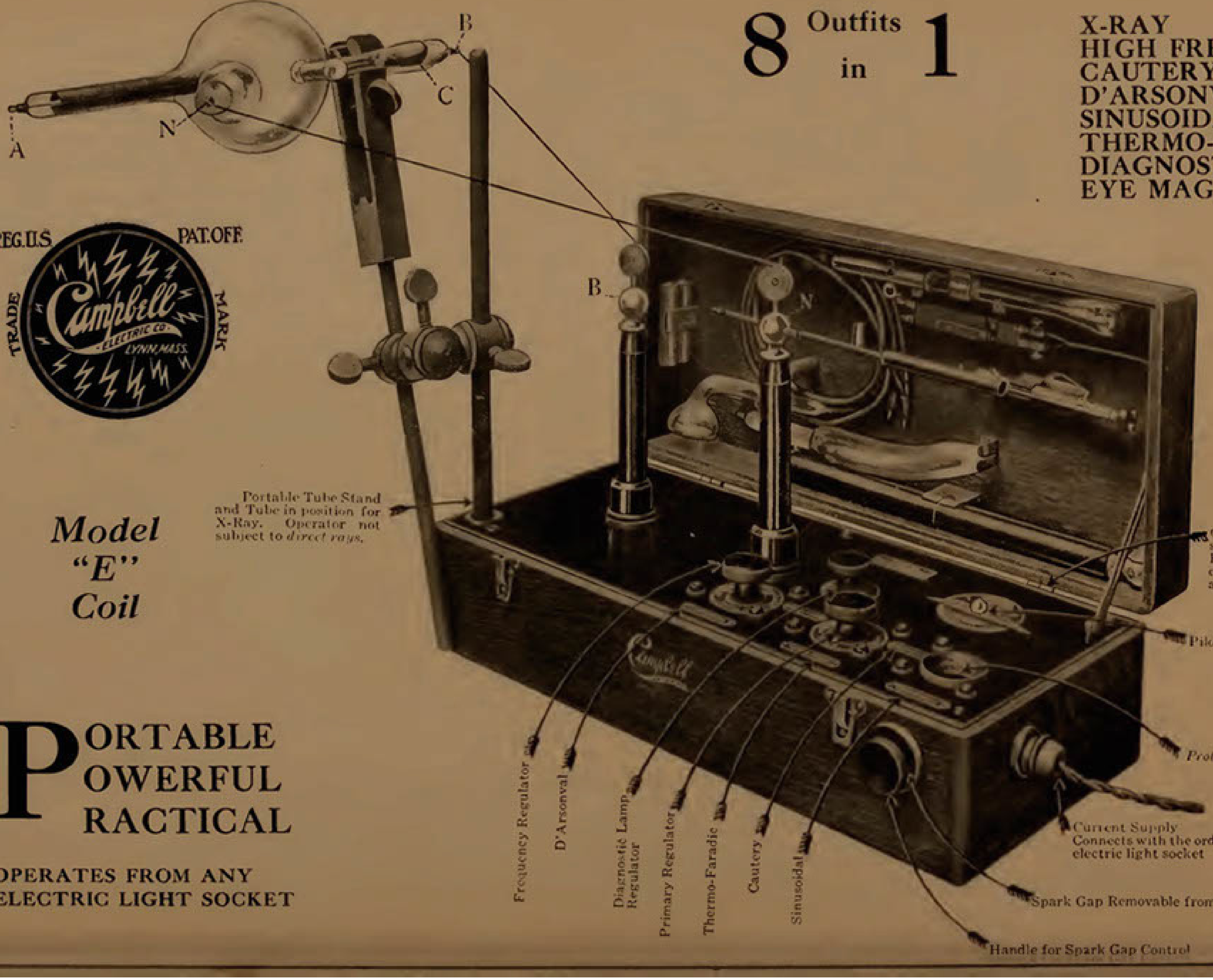
MODERN OFFICE EQUIPMENT
OUTFIT NUMBER SIX

See Page 10

8 Outfits in 1

X-RAY
HIGH FREQUENCY
CAUTERY
D'ARSONVAL
SINUSOIDAL
THERMO-FARADIC
DIAGNOSTIC LIGHT
EYE MAGNET

REG.U.S. PAT.OFF.
TRADE MARK
Campbell Electric Co.
Lynn, Mass.


A
N
B
C
B
N
Portable Tube Stand and Tube in position for X-Ray. Operator not subject to *direct rays*.
Cover Removable, by separable hinge. Provides for all accessories except tube and fluoroscope.
Pilot Light
Protected Spark Gap
Current Supply
Connects with the ordinary electric light socket
Spark Gap Removable from here
Handle for Spark Gap Control
Frequency Regulator
D'Arsonval
Diagnostic Lamp Regulator
Primary Regulator
Thermo-Faradic
Cautery
Sinusoidal
Campbell

Model "E" Coil

PORTABLE POWERFUL PRACTICAL

OPERATES FROM ANY
ELECTRIC LIGHT SOCKET

SUMMARY

	Page No.	Shipping Weight	Price
Coil complete	8	67 lb.	$180.00
Cabinet	2	135 lb.	30.00
Floor Tube Stand	2	31 lb.	10.00
Folding Fluoroscope, 5 x 7	11	2½ lb.	12.00
Set of six Vacuum Electrodes with handle	17	2 lb.	4.00
Heavy Anode X-Ray Tube, 6 in.	16	6 lb.	18.00
Treatment Chair	12	78 lb.	27.00
Auto Pad	14	3⅓ lb.	10.00
Table Tube Stand with Shield	15	40 lb.	27.00
Tube Shield with Special Support	15	8 lb.	10.00
Tube Shield without Support	15	5½ lb.	8.00
Rotary Converter (necessary only for use on direct currents)	20	67 lb.	35.00
Intensifying Screen 8 in. x 10 in.		8 oz.	15.00
Ozone Generator	19	2 lb.	10.00
Outfit Number Six	10	230 lb.	254.00
Outfit Number Five	10	110 lb.	224.00
Penetrometer	20	12 oz.	5.00
Carrying Case	11	5½ lb.	6.00
Heavy Anode X-Ray Tube 7 in.	16	6½ lb.	20.00
Small Tube Stand	8	1½ lb.	3.00
Heavy Cable with Swivel Attachment	2	6 oz.	1.50
Steel Tapes	8	8 oz.	each .75
Light Cord with Swivel Attachment	2	3 oz.	.50
Cords for Metal Electrodes		4 oz.	per pair .75
Cautery Outfit Complete	8	8 oz.	1.75
Diagnostic Lamp Outfit complete	8	6 oz.	3.50
Replacing Diagnostic Lamp—Tungsten		2 oz.	.50
Replacing Pilot Lamp—Tungsten		2 oz.	.50
Metal Hand Electrodes without Cords		4 oz.	per pair .30
Moist Electrodes without Cords		4 oz.	each .75
Universal Handle for Vacuum Electrodes	17	4 oz.	.75
Block Tin Electrodes		8 oz.	each .50
Extra Faces for Spark Gap		4 oz.	each 1.00
Replacing Fluoroscopic Screen per sq. in.		8 oz.	.25
Eye Magnet for use on Cautery Circuit		4 oz.	3.50
Vacuum Electrodes ordinary to fit Universal handle	17	6 oz.	each .75
Vacuum Electrodes insulated,	17	6 oz.	each 1.50

We are prepared to quote prices for electrodes of special design also for various types of treatment X-Ray tubes. Special attention will be given to the repair of X-Ray tubes and prices for same will be quoted on application.

TREATMENT CHAIR

The chair illustrated on the opposite page is built to take the place of the more cumbersome and expensive condensation couch and has a much wider range of usefulness.

It is made of quartered oak, handsomely finished, back automatically adjustable by push-button and is serviceably upholstered in Chase leather.

The back and seat form two condensers which may be connected or used separately as desired. The vacuum tubes and metal ball electrodes on either side may be connected independently to various terminals of the coil.

The points of connection on the chair are plainly marked with numbers and with each chair is furnished a diagram of all the circuits, points of connection marked with numbers corresponding to those on the chair.

When desired the chair is fitted with head section and leg support which form extensions of the two condenser sections. The head section is made to adapt itself to the contour of the occiput and cervical vertebrae and provides for complete contact with the entire spinal axis.

By means of various connections the chair may be used for administering the Sinusoidal, Thermo-Faradic, D'Arsonval or High-Frequency treatments, and it readily adapts itself for AUTO INDUCTION, AUTO CONDUCTION or AUTO CONDENSATION.

The various combinations of connection of circuits for general or local treatment are *limited only by the ingenuity of the operator.*

Every owner of a high-frequency apparatus should have this most useful accessory and we invite comparison of price with similar articles of much more limited range of usefulness.

Several of the important features are fully covered by letters-patent and can not be duplicated in any other similar apparatus on the market.

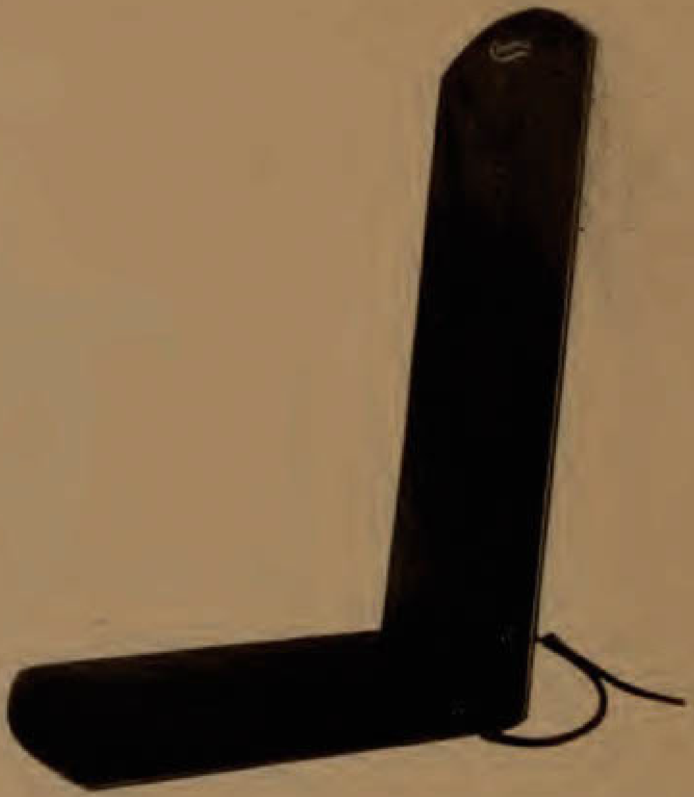
PRICES

Chair complete (except head section and leg section)	$27.00
Head Section extra	10.00
Leg Section extra	5.00

THE CAMPBELL "AUTO-PAD"

FOR

Auto Condensation, Auto Conduction, Auto Induction



This pad may be substituted for the treatment chair where economy of space is desirable, and is also extremely useful for portable work.

There is probably no method of using Electricity therapeutically that is so universally useful and so easy to apply as the D'Arsonval modality of AUTO CONDENSATION. Heretofore the couch used for that purpose has been rather expensive and cumbersome, and the insulation so thick that only the most powerful currents were sufficient to be of practical use.

We have recently brought out a pad for this purpose that we call an "AUTO PAD." While being but little thicker than a book cover, it is so perfectly insulated that a very heavy current of sufficiently high voltage to produce all the therapeutical effects obtained by D'Arsonval may be used without fear of sparking into the patient.

This pad is in two sections, hinged together and so arranged as to fit any ordinary chair, the patient sitting on one section and leaning against the other. These sections each have a contact to which the cord tips may be connected, and a cord is attached to the lower part of the upright section for the purpose of connecting the two together for AUTO CONDENSATION treatment.

Price, complete with attachment cord $10.00

INTRODUCTORY

High - Frequency Currents adopted as a standard method of treatment, and gives results where drugs fail.

Medical literature of the present day is so full of mention concerning the use of high-frequency currents in the treatment of disease that it is superfluous to use space in attempting to set forth their value. That they are being used more and more, even by the general practitioner, almost any medical publication will certify, and there is an extensive and well defined field in which it is proving of estimable value.

X-Ray diagnosis has revolutionized management of fracture cases.

Diagnosis by the X-Ray has revolutionized the management of fracture cases and has rendered possible a prompt and accurate recognition of abnormal conditions of the bony structure, and its use in the diagnosis of certain diseases is becoming more and more general. As technique improves, this field of work is becoming still more extensive.

High - Frequency Coil the most practical type of apparatus

The early and general use of the static machine has gradually given place to the more reliable and powerful coil, and among coils there has been a growing tendency to select those of the high-frequency type. With this type of coil the various therapeutic currents may be produced direct without the aid of cumbersome accessory apparatus, and recent improvements in construction have made it available for every class of radiographic work.

Campbell coil best suited to needs of the physician.

From the beginning of its manufacture special attention has been given to the development of the Campbell Coil as an X-Ray apparatus, and while at the same time the variety and quality of the high-frequency currents has been steadily increased, its capabilities as a producer of X-Rays have also been developed to the point where it will make the best of radiographs of any part of the human body, and with a minimum outlay of preparatory work. To the physician who is particularly interested in this class of work we shall be glad to send full particulars, together with samples of work done in the ordinary routine of general practice.

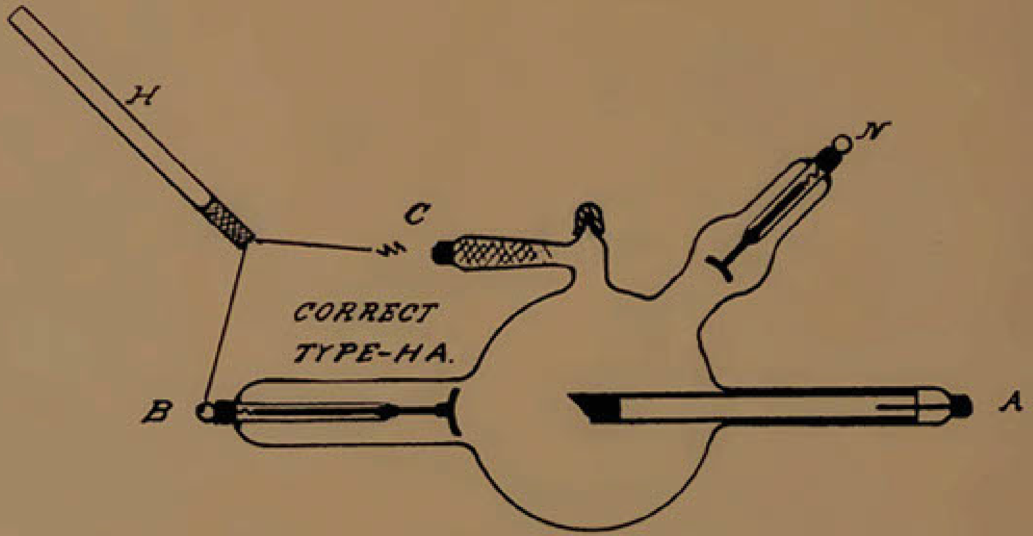
Campbell Electric Company interest does NOT cease with the sale.

The large number of Campbell outfits (about 2,500 at this writing) now in use not only makes it advisable, but also makes it possible, for the Campbell Electric Company to maintain a department for collection and exchange of valuable information relative to securing best results with electric apparatus. This department is in charge of a practical physician who has made electro therapy and radiography a specialty for the past ten years. The service is freely at the disposal of our customers and has demonstrated itself to be of value to the customer equal to the apparatus itself—but costs him nothing.

In concluding we wish to assure you that should you purchase a Campbell outfit we will endeavor that you never have cause to regret your purchase.

CAMPBELL ELECTRIC CO., Inc.

THE "CORRECT" HIGH-FREQUENCY TUBE



Ever since we commenced the manufacture of High-Frequency coils our problem has been not so much the production of powerful apparatus as to find a tube which would take care of the current provided and stand up under hard work. After trying all tubes from leading manufacturers it seemed imperative for us to have something better adapted to the needs of the Campbell Coil.

As a result we designed the tube illustrated above and for the last two years and a half have used practically the entire output of the factory in which they are made.

The "Correct" tube is built on scientific principles and is exhausted by experienced operatives. During exhaustion it is connected with a Campbell coil and as a result is perfectly adapted to this coil on completion.

Before leaving the tube factory, it is run for a continuous period of five minutes at the full output of the coil and if during that run it does not hold its vacuum it is unsealed and returned to the pumps for re-exhaustion.

After completion it is rested for a definite period in our stock department and before shipment is given another test, failing to meet this test it is returned to the tube factory for re-exhaustion.

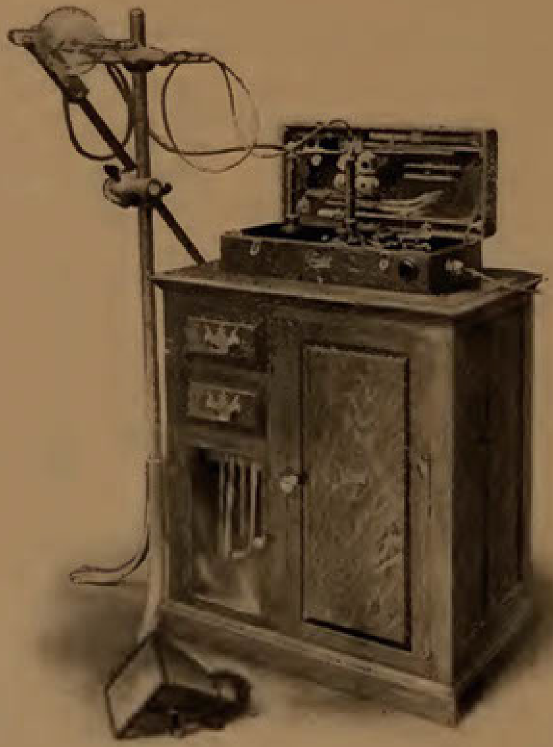
Bearing in mind the fact that the X-Ray tube is a combination of fragile glass and an almost perfect vacuum and that like any delicate piece of mechanism it may be injured or ruined by ignorant or improper handling we can unhesitatingly recommend this tube as the most satisfactory High-Frequency X-Ray tube built and the least likely to give trouble to the operator.

Price 6 inch tube . .	**$18.00**	Price 7 inch tube . .	**$20.00**

OUTFIT NUMBER SIX

(See Page Two)

Will Give X-Ray—High Frequency—Cautery—D'Arsonval Sinusoidal—Thermo Faradic—Diagnostic Light



CAMPBELL MODEL "E" PORTABLE COIL WITH CABINET, ETC.

Furnished with Outfit Number Six (see also page 2)

Model "E" Coil complete same as shown on page 8 Cat. No.	$180.00
Cabinet	30.00
Heavy Anode X-Ray Tube	18.00
Floor Tube Stand	10.00
Fluoroscope with P. B. C. Screen, 5x7	12.00
Set of six Vacuum Electrodes with handle	4.00
Outfit complete boxed ready for shipment (250 lbs.) Cat. No.	**$254.00**

Our Number Six outfit is a most complete and beautiful piece of office equipment and in a few minutes it can by removal of coil from cabinet be converted into the most compact and efficient portable coil on the market.

Here is the ideal equipment. No physician's office is complete without it.

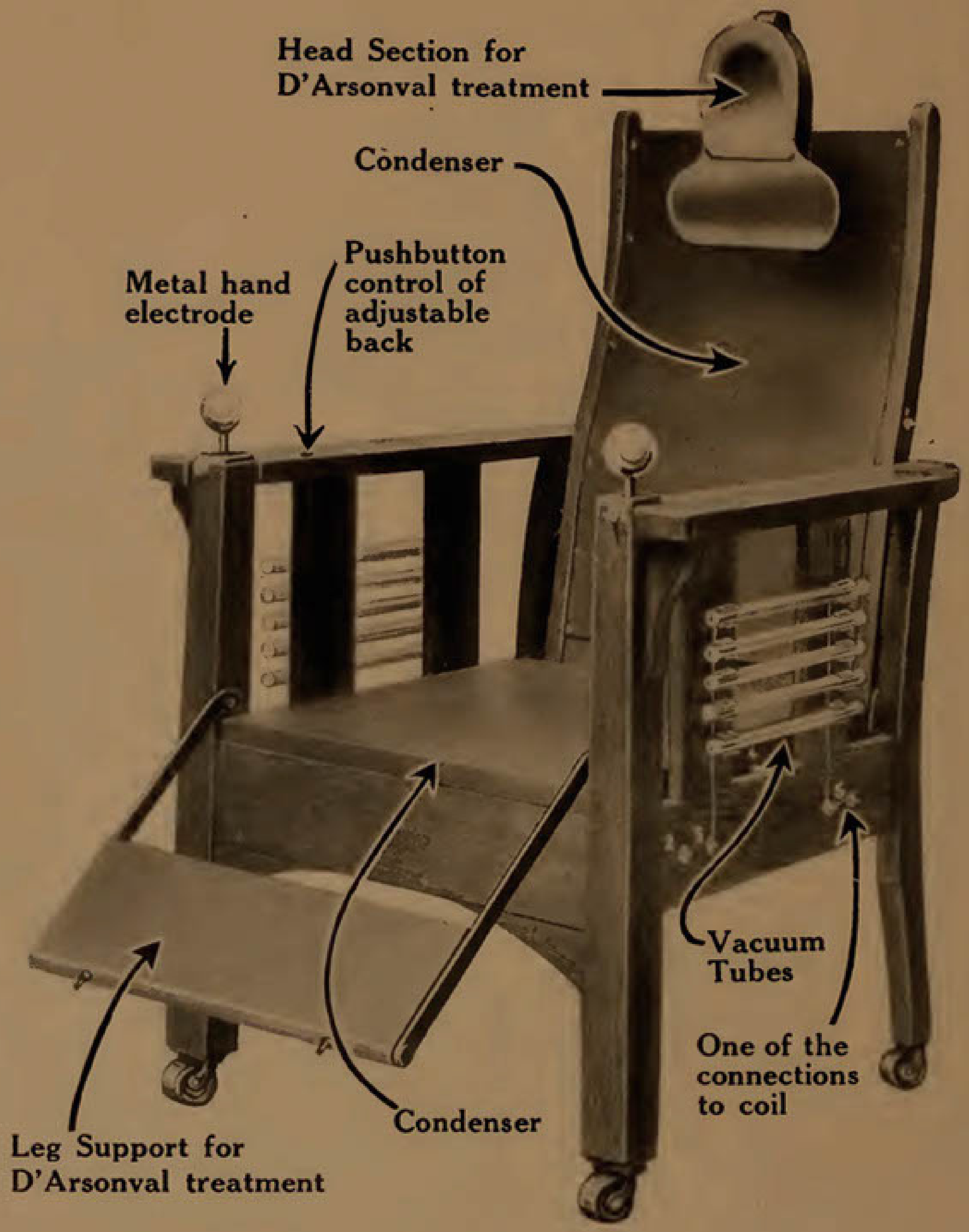
OUTFIT NUMBER FIVE

Same as Outfit Number Six except that cabinet is not included.

Outfit complete boxed ready for shipment (120 lbs.) . . . **$224.00**

Complete instructions furnished with each outfit for setting up and operating.

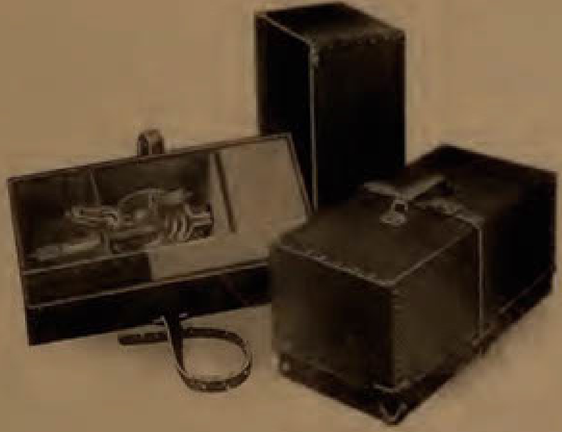
Auto-Condensation—Auto-Conduction—Auto-Induction. Violet Ray—Also for applying Sinusoidal and Thermo Faradic Currents


Head Section for D'Arsonval treatment
Condenser
Pushbutton control of adjustable back
Metal hand electrode
Vacuum Tubes
One of the connections to coil
Condenser
Leg Support for D'Arsonval treatment

CAMPBELL HIGH FREQUENCY "TREATMENT CHAIR"

"The Electric Chair"
(Patented)

CARRYING CASE

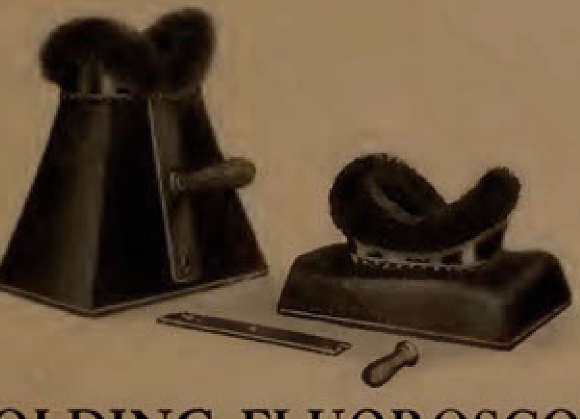


The carrying case is made to hold two X-Ray tubes in our special tube box, a set of electrodes and handle also in box, our new folding fluoroscope as described below and several X-Ray plates. Is telescopic and can be used to carry considerable other goods; is made of light colored fibre, strongly riveted, and fitted with leather straps and handle. Waterproof and indestructible. Weighs less than five pounds and is the most practical and serviceable carrying case which has been presented to the profession. Price **$6.00**

Auto Car

CANVAS COIL COVER

Made of heavy brown waterproof canvas, lined with soft cloth. Very desirable for protection of coil case during transportation to and from your outside work. Price $3.50.



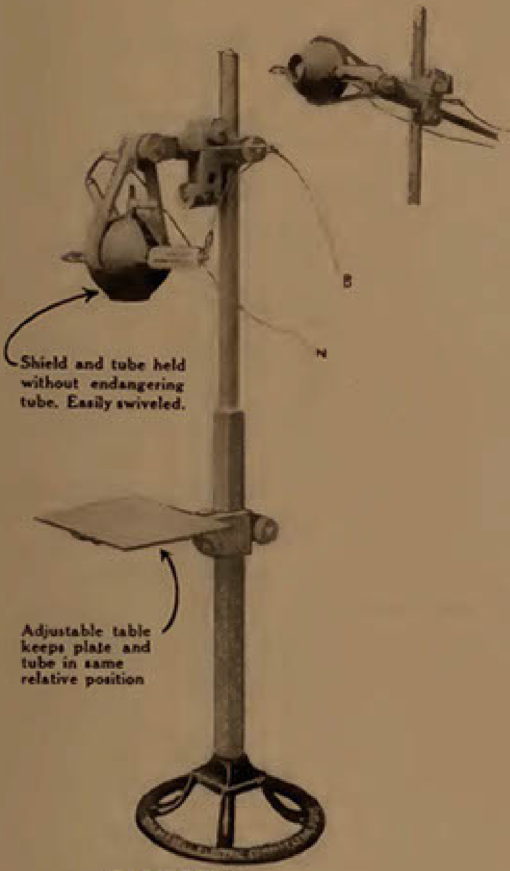
FOLDING FLUOROSCOPE

Patented February 14, 1911

While this fluoroscope has been specially designed for portable work, it is equally serviceable for office use. It is built on the plan of an opera hat and collapses into an oblong package 9 inches by 7 inches, with a thickness of 3 inches. It is fitted with a first quality P. B. C. screen, protected by a plate of glass which serves the double purpose of protection to the screen as well as to the eyes of the operator.

Price with plain glass screen **$12.00.** Lead glass screen, $1.00 extra.

THE TABLE TUBE STAND AND DIAPHRAGM APPARATUS



Shield and tube held without endangering tube. Easily swiveled.

Adjustable table keeps plate and tube in same relative position

CAMPBELL
"TABLE TUBE STAND"

THE STAND

No metal parts except the base.

Made of quarter sawed heavy oak handsomely finished.

Wooden jaws for support of tube shield.

Tube holds only its own weight.

Easily adjusted to all positions.

Adjustable radiographic table.

Fixed relation between tube and table.

Very rigid and practically free from vibration.

THE TUBE SHIELD

Made of flexible X-Ray proof material.

Fitted with diaphragms of three sizes.

Two sizes of treatment cylinders to fit diaphragms.

Supports tube instead of being supported by tube.

Protects patient and operator.

Treatment can be accurately localized.

Cuts off all but direct rays in radiography.

Physicians who are doing much radiographic or treatment work will find this stand indispensable.

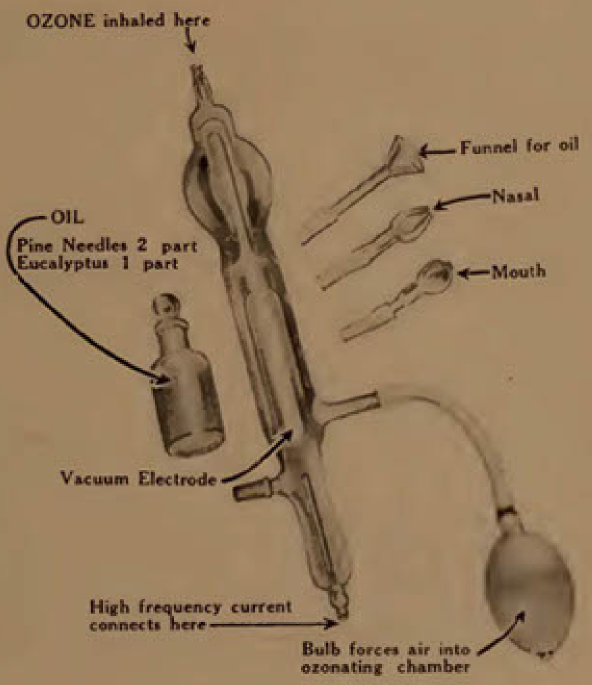
In radiography it may be used for all parts of the body with the exception of the trunk insuring a fixed distance between tube and plate and an accurate centering of part examined with the plate.

For treatment it serves the double purpose of protection and limitation of area exposed. The treatment cylinders offer an additional aid to accurate localization.

Prices

Table Tube Stand complete with shield, diaphragms and cylinders	**$27.00**
Tube Shield complete with Special Support for use in ordinary tube stand	**10.00**
Tube Shield only with diaphragms	**8.00**

OZONE GENERATOR


OZONE inhaled here
Funnel for oil
Nasal
OIL
Pine Needles 2 part
Eucalyptus 1 part
Mouth
Vacuum Electrode
High frequency current connects here
Bulb forces air into ozonating chamber

CAMPBELL OZONATOR
for use with Campbell High Frequency Coil

Of late much has been written of the use of ozone in the treatment of certain respiratory conditions and there are on the market a number of instruments for the production of ozone alone, several of which are sold at a price equal to that of our entire outfit. Inasmuch as the production of ozone depends upon the decomposition of the atmosphere by a high-tension spark the Campbell Coil is an ideal apparatus for this purpose.

Briefly, by means of a hand bulb the ozone produced in this "Ozonator" is pumped through a reservoir containing a mixture of oil of Eucalyptus and Pine Needles. This oil serves the double purpose of removing from the ozone several impurities, notably nitrous acid which is irritating in the extreme to mucous surfaces, also of depositing direct upon those mucous membranes a fine vapor of the oils in combination with the ozone. A number of operators prefer to use the Pine Needle oil alone avoiding the stimulating effect of the Eucalyptus.

Where local treatment alone is desired our Ozonator serves the purpose equally well with the more bulky and costly apparatus and in volume produced is infinitely superior to many of the large machines sold as ozone generators. This "Ozonator" may be readily attached to any air tank used for nebulizing apparatus instead of using hand bulb.

Price, complete as illustrated, **$10.00**

What can I get from the Campbell in the way of currents?

1. **High Frequency Currents**, to be applied with various vacuum electrodes, ranging from a soft and full discharge, which can be painlessly applied to the most sensitive parts of the body or in its cavities, up to a large volume of current at a lower frequency, capable of producing local stimulation up to the point of rubefaction, or even vessication.

2. **A D'Arsonval Current**, which is a true current of this type and which at the maximum *output* will run from *700* to *800* milliamperes, or even higher.

3. **A Thermo Faradic Current**, which is a true D'Arsonval current of a milder form, running from 200 to 400 m. a., and which, by actual test with a hot-wire meter registers as much as the D'Arsonval of larger apparatus, sold at a higher price than one of our complete outfits.

4. **A Sinusoidal Current** with a wide range of volume, and far in advance of similar currents produced by wall plate transformers.

5. **An X-Ray Current** sufficient for all needs, whether for therapeutic or diagnostic work, including radiographs of any part of the body.

6. **A Diagnostic Lamp Current** better and more reliable than that furnished by special outfits for this purpose, and which entirely does away with variation and annoyance incident to apparatus operated by batteries.

7. **A Cautery Current** of sufficient volume to operate any cautery instrument, and subject to control, so that it may be varied to produce dull red heat in a fine instrument or white heat in a heavy one.

8. **An Eye Magnet Current** capable of exciting a small eye-magnet to a lifting capacity of several ounces.

What is the guarantee given with your Coil?

The Campbell Coil is guaranteed against mechanical defect for a period of two years. Any disability arising from legitimate use will be repaired free of expense within that period, provided the coil or defective part is returned to our factory prepaid.

What are your prices and terms?

The prices are net as contained in this catalog, with a discount of 5 per cent. for cash. Prices include crating, F. O. B. Lynn or our nearest supply station.

Can I buy on easy terms, and at what rate?

Yes. If you are an established physician in good standing we will loan you the greater part of the amount necessary to buy any of our outfits, and you can pay us back in monthly payments. This gives you an opportunity to make your coil earn more than enough in the way of extra work to pay for itself. A number of doctors are buying in this way, as it saves them the necessity of paying out any large amount at one time. If you are interested in this plan we shall be glad to give you full particulars.

Following are extracts from a few of the many letters received from our customers in various parts of the United States. Full name and address will be forwarded upon request.

MINNEAPOLIS, MINN., SEPT. 14, 1911

Gentlemen:—I am well pleased with the possibilities of the Campbell coil and am glad to report the removal and healing of an Epithelioma with 6 exposures with the Piffard tube. I have had some 5 years experience with the use of X-Ray on Epitheliomas, (Skin Cancers) and was astonished at the rapid work of the Piffard tube when used with a Campbell Coil as compared with my former machine.

F. C. W.

OGDEN, UTAH, SEPT. 12, 1911

Gentlemen:—I am well pleased with my outfit. It is a good dividend payer and then the conveniences as well. A. A. R.

SALEM, OREGON, AUG. 17, 1911

Dear Sir:—In speaking of the Campbell Coil, will say I have owned one for three years and have done splendid X-Ray work with it which shows in the service and number of plates in my office, open for inspection to any one who may wish to see them.

I have also done considerable treatment and shall certainly do more in the future after the valuable instruction and information on treatments with the different Electrodes and the use and application of the X-Ray tube by you.

My dealings with Campbell Electric has been entirely satisfactory.

Thanking you very much for service rendered, I am. O. B. M.

TOLEDO, OHIO, AUG. 22, 1911

Gentlemen:—I have been highly delighted with the instrument which you supplied me and which has certainly paid for itself several times over. W. A. G.

MEMPHIS, TENN., JUNE 6, 1911

Gentlemen:—In reference to the Campbell Coil, I must frankly admit that I have not had one minutes trouble with your machine as I do an exclusive Skin and Genito-Urinary practice, I find your Coil a "Sine Qua Non," in my business. I call upon it so often for X-Ray, High-Frequency, Diagnostic Lamp and Cautery purposes, and I am not only getting results, but likewise the money, which, of course is the proper thing.

Am still using the same X-Ray tube which came with the Model E Coil, and if you will kindly refer to your records, you will ascertain how long it has been in use.

Again assuring you, I am but putting it mildly, when I tell you that I am more than extremely pleased with your Model E Combination Coil. L. H. P.

PORTLAND, ORE., JUNE 3, 1911

Dear Sir:—In reply to your request I will say that I can only speak of my Campbell machine in words of highest praise. I am a great believer in the high-frequency current, and I now feel sure of getting it all the time, as the machine has not been out of order for a minute since I set it up. C. L. R.

WELLESLEY, MASS.

I want to thank you for the help you have given me in starting my X-Ray and electrical work. It has proven the most valuable aid in my practice. The Campbell apparatus has been perfectly satisfactory and I am greatly pleased with it. G. C. A.

PORTLAND, ORE., SEPT. 25, 1911

Dear Sir:—I have been using your machine now for about 9 months and I must say that I am highly pleased with it. A. T. Y.

MODEL "E" COIL

This coil is designed to operate from alternating circuits and is wound to accommodate the ordinary combinations of volts and cycles in commercial use.

The various currents which may be obtained are indicated in the cut on opposite page.

It may be operated from an ordinary electric lamp socket without special wiring, and is therefore available at the bedside of the patient as well as in the office of the doctor.

While it is compact and of moderate size it may be made into a more imposing piece of office furniture by being placed in the cabinet especially constructed for this purpose and illustrated under our special outfits.

We manufacture every part of the coil in our own factory, and every step is constantly under the supervision of an expert electrician. By means of improved machinery and methods of construction extreme accuracy and uniformity are obtained, and every part of the apparatus, from the hinges up, is so standardized and so accurately assembled that any portion of the coil is interchangeable with the same part of any other.

To meet the varying needs of the practitioner or the specialist we have arranged certain combinations into outfits, which we list on page 10.

The finish of our stock coil is golden oak but we can furnish any desired finish to match balance of office furniture at a *slight additional* charge.

To suit a limited demand we carry in stock cabinets and coils in solid mahogany which we can supply at an extra cost of $3 for coil case and $5 for cabinet.

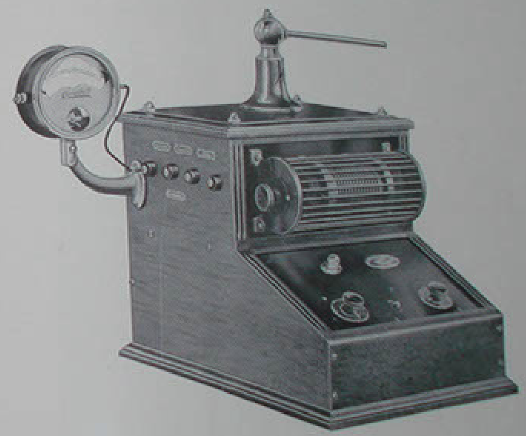
INDEX

	PAGE
Model "CA" Diathermy	23-25
Model "CE" Diathermy (Portable)	26
Model "CI" Diathermy	27
Model "CH" Diathermy (Portable)	28
Rotary Converters	28
Time Switches	28
Milliameter	28
Auto Condensation Chair	28
Auto Condensation Pad	28
Foot Switches	28
Vacup Diathermy Clamps	29
Coagulation Electrode	29

	PAGE
Fulgeration Electrode	29
Diathermy Metal	29
Vacuum Electrodes	30
Diathermy Electrodes	31
Alpine and Kromayer Lamps	31
Luxor Lamps	32
Reserve Burners	32
Soilux Lamps	33
Applicators and Spare Parts	33
Morse Wave Generator	35
Air and Vacuum Apparatus	35
Air and Vacuum Accessories	35

CAMPBELL DIATHERMY

MODEL "CA"



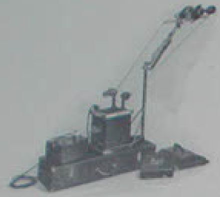
SPECIFICATIONS

Adjustable Frequency (Stimulating or Sedative) Dual Control, Selective Voltage— Variable Penetration — Fully Adjustable Compensating Spark Gap (Quiet, Steady) Flexible Regulation.

Most Powerful Diathermy Built

For Price List, see page 25

Clinette Portable X-Ray Unit, 110 Volts, A. C.



Catalogue	SPECIFICATIONS	Price
12140	Transformer Coil, portable type, with Carrying Handle, Cover, Posts, Cords, Reels, etc.	$335.00
12106	Control Case, with Auto-Transformers, Meters, Rheostat, etc.	115.00
12141	Bracket Tube Stand, adjustable, with Base, Extension, etc.	95.00
12142	Carrying Case	40.00
12107	Foot Switch	15.00
12125	Lead Glass Shield for Tube	25.00
12112	Coolidge X-Ray Tube, radiator type	125.00
12145	**CLINETTE PORTABLE X-RAY UNIT COMPLETE as above (Code Word "Clinette")**	**750.00**
12119	Automatic Time Switch, hand type, 0-12 Second Range	48.00
12143	Cone Holder with two Cones	25.00
14413	Cassette, 11x14 Buck	17.50
14514	Intensifying Screens, 11x14 pr.	28.00
14411	Cassette, 8x10 Buck	13.50
14512	Intensifying Screens, 8x10 pr.	14.00
15170	Hand Fluoroscope, 5x7	25.00
13502	Bucky Diaphragm, flat top, 12x12 (for 11x14 Films)	175.00
12121	Rotary Converter, for D. C., portable type	100.00

POWERFUL **PORTABLE** **PRACTICAL**

Clinette Mobile Portable X-Ray Unit

A combination Portable X-Ray Unit and Mobile Office or Ward X-Ray Unit. Can be easily transported to bedside of patient and serve as an efficient compact Mobile Unit in the office or ward.

Catalogue	SPECIFICATIONS	Price
12140	Transformer, Portable Type, with Carrying Handle, Cover, Posts, Cords, Reels, etc.	$335.00
12106	Control Case, with Auto-Transformers, Meters, Rheostat, etc.	115.00
12132	Tube Stand, Counterweighted Type	150.00
12144	Mobile Base, with Cable, etc.	85.00
12107	Foot Switch	15.00
12125	Lead Glass Shield for Tube	25.00
12112	Coolidge X-Ray Tube, Radiator Type	125.00
12146	Clinette Mobile X-Ray Unit, as listed, complete (Code word Mobette)	$ 850.00
12141	Bracket Tube Stand, Adjustable Type, with Base, Extension, etc.	95.00
12142	Carrying Case	40.00
12147	Clinette Mobile X-Ray Unit, as listed, Complete with Bracket Tube Stand, and Carrying Case for combination home and office use	$ 985.00
12148	Same as Above, but with Automatic Hand Timer (12119) and Circuit Breaker (12110)	$1,065.00

Developing Tanks

Catalogue	SPECIFICATIONS	Price
15101	Porcelain Enameled Developing Tank (three compartment) for 14x17 Films	$40.50
15102	Vitrified Developing Tank, complete with connections	69.50
15103	Sterling Enameled Tanks, 2x15x15	11.50
15104	Sterling Enameled Tanks, 2½x8¾x14	10.00
15105	Sterling Enameled Tanks, 2½x14¾x20	12.00
15106	Sterling Enameled Tanks, 4½x14¾x20	13.50
15107	Sterling Enameled Tanks, 14¾x14¾x20	23.00
15108	Porcelain Enameled Developing Tank (three compartment) for 8x10 Films, with Lids	30.00
15109	Same as 15108, except without Lids	28.50

Developing Trays

Catalogue	SPECIFICATIONS	Price
15110	Porcelain Enameled Trays, 5x7 , each	$1.25
15111	Porcelain Enameled Trays, 7x9 , each	1.50
15112	Porcelain Enameled Trays, 8x10, each	1.75
15113	Porcelain Enameled Trays, 10x12, each	2.50
15114	Porcelain Enameled Trays, 11x14, each	3.80
15115	Porcelain Enameled Trays, 14x17, each	5.30

*Eastman Duplitized X-Ray Films

Catalogue	SPECIFICATIONS		Price
15116	5x7	per dozen	$ 1.45
15117	6½x8½	per dozen	2.30
15118	8x10	per dozen	3.30
15119	10x12	per dozen	5.20
15120	11x14	per dozen	6.60
15121	14x17	per dozen	10.05

Eastman Safety Duplitized Films

Catalogue	SPECIFICATIONS		Price
15122	5x7	per dozen	$ 1.75
15123	6½x8½	per dozen	2.80
15124	8x10	per dozen	4.10
15125	10x12	per dozen	6.25
15126	11x14	per dozen	7.95
15127	14x17	per dozen	12.30

Note: *In ordering specify "Super Speed" or "Contrast."*

Eastman Dental X-Ray Films

Catalogue	SPECIFICATIONS	Price
15130	Radiatized "A", per package	$1.15
15131	Regular (Non-Curling) "B", per package	1.40
15132	Extra Fast (Non-Curling) "BB", per package	1.40
15133	Regular "C", per package	.70
15134	Extra Fast "CC", per package	.70
15135	Bite Wing, Type 1, per package	1.25
15136	Bite Wing, Type 3, per package	1.75

Safelight Lamps

15137	Brownie Safelight Lamp	$ 1.75
15138	Eastman Safelight Lamp	3.00
15139	Kodak Safelight Lamp	3.50
15140	Wratten, No. 1, with Slide	10.00
15141	Wratten, No. 2, without Slide	8.00

X-Ray Developing Powders

15142	No. 2 package of six powders, sufficient to prepare 12 oz. ready to use solution	$ .60
15143	No. 3 package sufficient to prepare one gallon ready to use solution	.85
15144	No. 4 package sufficient to prepare five gallons ready to use solution	3.50

X-Ray Fixing Powders

15145	No. 3—To make one gallon solution	$ .60
15146	No. 4—To make five gallons solution	2.50

X-Ray Film Hangers

15147	5x7	$ .75
15148	6½x8½	.85
15149	8x10	1.25
15150	10x12	1.50
15151	11x14	1.75
15152	14x17	2.00

Dental Film Hangers

12162	10 Clips	$1.25
12163	10 Clips, Short Model	1.25
12164	14 Clips	1.50

PRICE LIST

X-RAY AND PHYSICAL-THERAPY
APPARATUS

ACCESSORIES AND SUPPLIES

All Prices Are F. O. B. Lynn, Mass.
and subject to change without notice
Always order by Catalogue number and
give full description. Cash discount
quoted on request

CAMPBELL ELECTRIC MFG. CO.
Campbell Building 15-19 Stewart Street
LYNN, MASSACHUSETTS

Campbell
ELECTRIC CO.
LYNN, MASS.

CAMPBELL ELEC. CO.
CAMPBELL ELECTRIC COMPANY
CAMPBELL ELECTRIC COMPANY

"The Plant That Serves You"

A large and modern factory, designed and constructed with especial reference to efficiency in the manufacture of X-ray and other electrical apparatus.

Our host of professional friends is our reward for past efforts and we shall endeavor in the future, as we have in the past, to furnish our customers with the best possible apparatus, and what is of equal importance, the best possible SERVICE.

Campbell
ELECTRIC CO.
LYNN, MASS.

X-RAY SECTION

Campbell
ELECTRIC CO.
LYNN, MASS.

APPARATUS
ACCESSORIES—SUPPLIES

Campbell Dental X-Ray Unit

Catalogue	SPECIFICATIONS	Price
12175	Transformer	$225.00
12176	Cabinet, with Meters, High Tension Post, Casters, Auto-Transformer, etc.	135.00
12179	Bracket Tube Stand, Dental type	95.00
12177	Lead Glass Shield for Tube	30.00
12178	Coolidge Tube, Dental type	125.00
12107	Foot Switch	15.00
12180	**CAMPBELL DENTAL X-RAY UNIT COMPLETE as listed (Code Word "Camdent")**	**625.00**
12129	Automatic Time Switch, hand type, 0-12 Second Range	48.00

For use on 110 v., 60 c., A. C.
65,000 Volts, 0-10 M. A.

Campbell Coolidge DENTAL X RAY UNIT

Priced Right

$625.00
Complete

Built Right

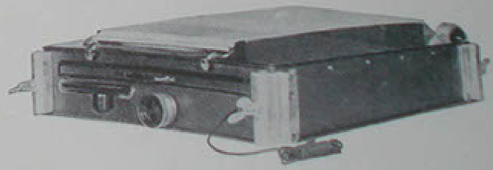
Meters — Switches

Catalogue	SPECIFICATIONS	Price
12181	Milliammeter, 8 inch Double Scale, 20-200 M. A., unmounted	$65.00
12182	Same as above, mounted	75.00
12183	Milliammeter, 3 inch, 0-30	15.00
12184	Ammeter for Filament Circuit	45.00
12185	Voltmeter, 0-200 K. V. (6 inch)	60.00
12186	Voltmeter, 0-120 (3 inch)	15.00
12188	Spark Meter, 3-6 inch S. G. (3 inch)	18.00
12139	High Tension Masts	65.00
12189	High Tension Overhead Switch	75.00

Tables

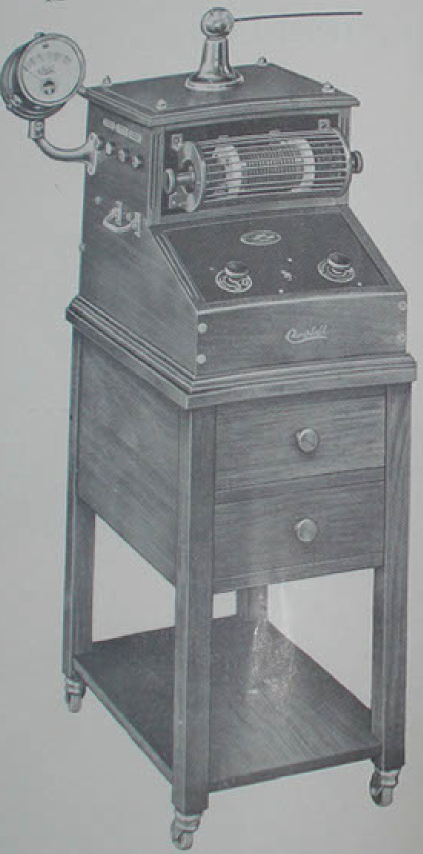
Catalogue	SPECIFICATIONS	Price
13200	Plain Radiographic and Treatment Table	$ 50.00
12113	Plain Table, with Bucky Blocks	85.00
12514	Adjustable Type Table for use with Deep Therapy Drum No. 12510	225.00
12115	Curved Top Table for Bucky	145.00
12515	Plain Table with Cushions for use with Deep Therapy Drum	150.00
12516	Plain Table with Cushions and with three hinged sections	225.00

Bucky Diaphragms



Catalogue	SPECIFICATIONS	Price
12116	Curved Top Bucky Diaphragm for 14x17 and Smaller Cassettes	$250.00
12114	Flat Top Bucky Diaphragm for 17x17 and Smaller Cassettes, with Electric Contact Device and Compression Band	260.00
13502	Flat Top Bucky Diaphragm for 11x14 and Smaller Cassettes, with Bakelite Top, Compression Band, Corner Sockets, etc.	175.00
13503	Corner Post Rods for 11x14 Bucky	3.50
13504	Casting and Post for Head Clamp	7.50
13501	Electric Contact Device for Curved Style Bucky	5.00
12111	Fluoroscopic Bucky Diaphragm	27.00

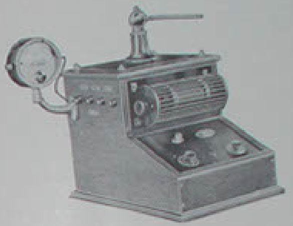
MODEL "CA" DIATHERMY



ILLUSTRATED WITH MOBILE TABLE

MODEL "CA" DIATHERMY

Beautiful Design



MODEL "CA"

MODEL "CA" DIATHERMY

Efficient Design

SPECIFICATIONS

Catalogue		Price
16101	**MODEL "CA" DIATHERMY for use on 110 v., 60 c., A. C., with Cords, Oudin Terminal, Meter Bracket, Handles, etc. Brown mahogany, black and nickel trimmings**	$360.00
16102	Milliameter, Double Scale	35.00
16100	**MODEL "CA" DIATHERMY OUTFIT as listed, ready to operate (Code Word "Camet")**	395.00
16103	Mobile Table for use with above	45.00
16104	Vacup Diathermy Clamps, set	22.00
16105	**MODEL "CA" DIATHERMY OUTFIT as listed under Cat. No. 16100 and with Cat. Nos. 16103-04 (Code Word "Camca")**	445.00
16106	Fulgerator, set complete	6.50
16107	Coagulator, set complete	10.50
16108	Foot Switch	15.00
16109	Vacuum Electrode Handle	6.50
16110	Vacuum Electrodes, set of six	7.50
16111	Cataphoric Electrode	4.00
16112	Single Eye Electrode	3.00
16113	Double Eye Electrode	4.00
16114	Auto Condensation Chair with handle	85.00
16115	**MODEL "CA" DIATHERMY OUTFIT as listed and including above Applicators and Accessories (Code Word "Camplete")**	575.00

1898 1928

THIRTY YEARS OF PROGRESS WITH CAMPBELL

Model "G"

The first successful X-Ray and High Frequency Apparatus manufactured in the United States was built by
CAMPBELL
1898

Introduced to A. M. A. 1901

Ten years later thousands of improved types were giving service to the medical profession.

Model "E"

Model "I"

Steady and constructive progress by Campbell engineers, produced the perfected combination X-Ray and Electro-Medical equipment pictured to the left, many times copied but never equaled.

And now, in 1928, just thirty years since Campbell produced the first Diathermy apparatus in the United States, there is available a complete line of efficient quality X-Ray equipment pictured on pages 1 to 14 inclusive of this booklet as well as four models of Diathermy apparatus (pages 23 to 28 inclusive), producing every modern modality radically in advance of anything yet offered. Send for catalogue.

Two Views of the Factory that Serves You

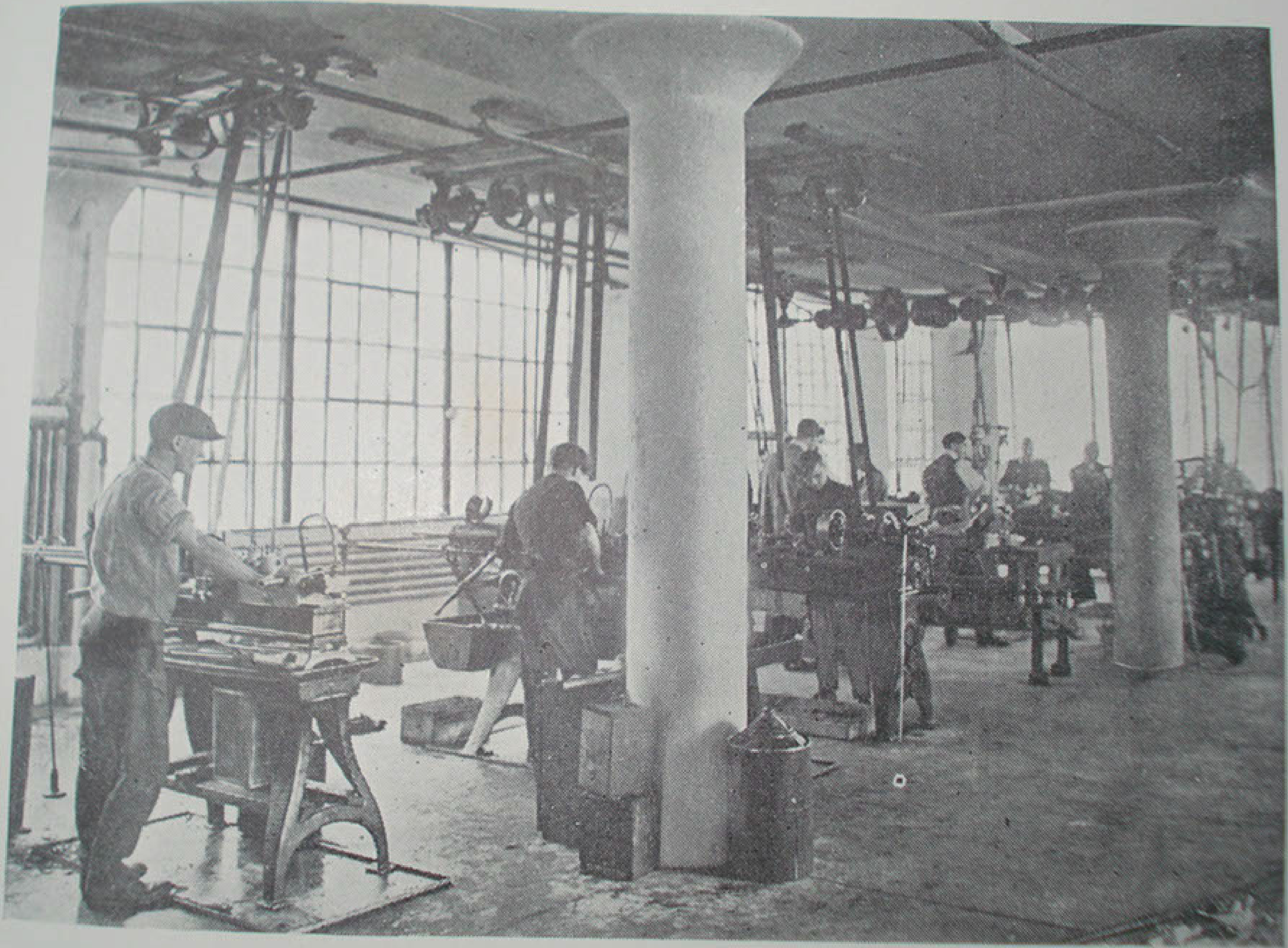
Screw Machines

SIX-FLOOR MODERN CEMENT BUILDING

A Corner of Our Machine Shop

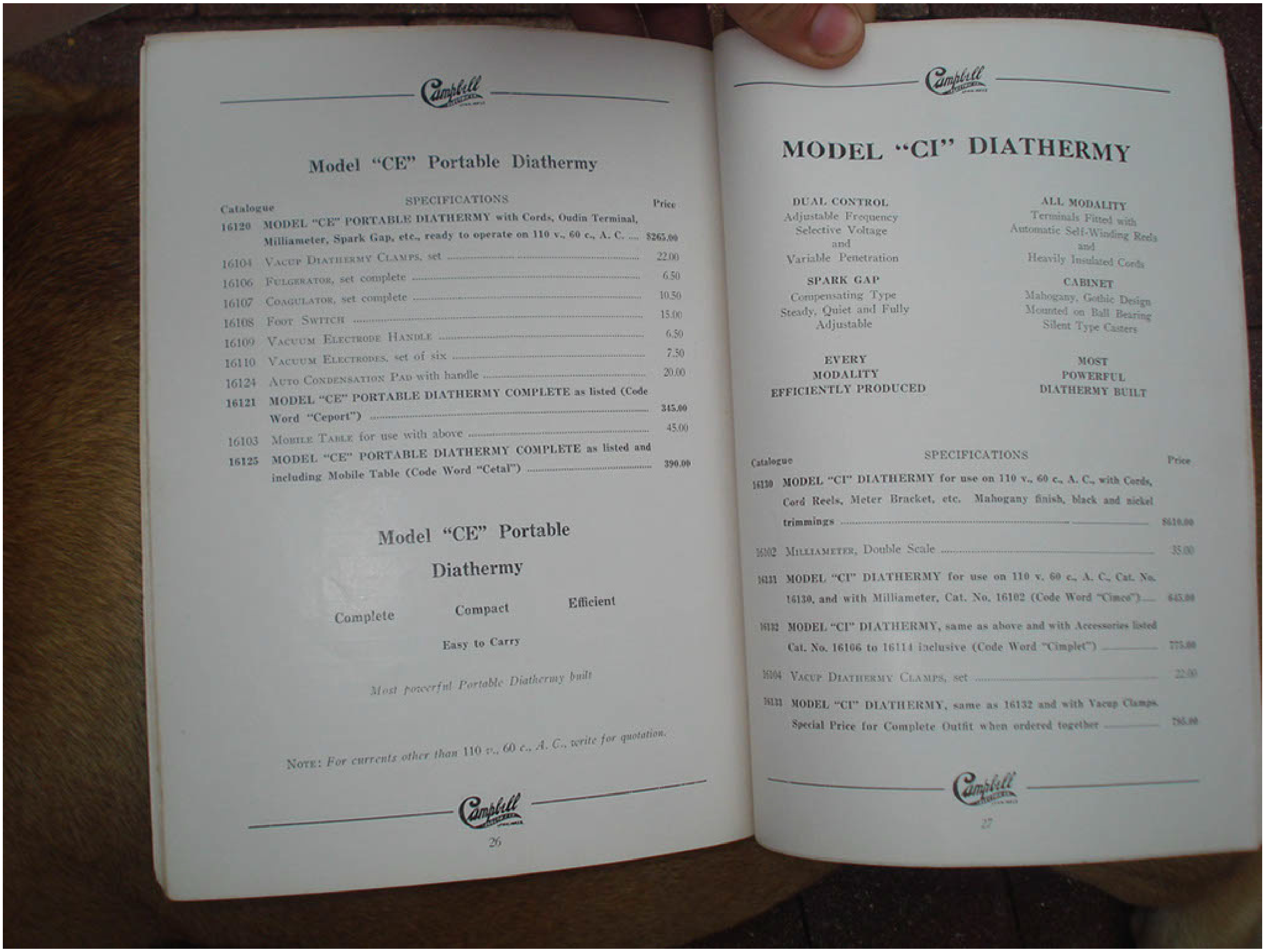
TRAINED OPERATIVES OF LONG EXPERIENCE

Two Views of the Factory that Serves Yo



Screw Machines

Campbell
Electric Co.
LYNN, MASS.



Model "CE" Portable Diathermy

SPECIFICATIONS

Catalogue		Price
16120	**MODEL "CE" PORTABLE DIATHERMY with Cords, Oudin Terminal, Milliameter, Spark Gap, etc., ready to operate on 110 v., 60 c., A. C.**	$265.00
16104	Vacup Diathermy Clamps, set	22.00
16106	Fulgerator, set complete	6.50
16107	Coagulator, set complete	10.50
16108	Foot Switch	15.00
16109	Vacuum Electrode Handle	6.50
16110	Vacuum Electrodes, set of six	7.50
16124	Auto Condensation Pad with handle	20.00
16121	**MODEL "CE" PORTABLE DIATHERMY COMPLETE as listed (Code Word "Ceport")**	345.00
16103	Mobile Table for use with above	45.00
16125	**MODEL "CE" PORTABLE DIATHERMY COMPLETE as listed and including Mobile Table (Code Word "Cetal")**	390.00

Model "CE" Portable

Diathermy

Complete Compact Efficient

Easy to Carry

Most powerful Portable Diathermy built

Note: *For currents other than 110 v., 60 c., A. C., write for quotation.*

MODEL "CI" DIATHERMY

DUAL CONTROL
Adjustable Frequency
Selective Voltage
and
Variable Penetration

ALL MODALITY
Terminals Fitted with
Automatic Self-Winding Reels
and
Heavily Insulated Cords

SPARK GAP
Compensating Type
Steady, Quiet and Fully
Adjustable

CABINET
Mahogany, Gothic Design
Mounted on Ball Bearing
Silent Type Casters

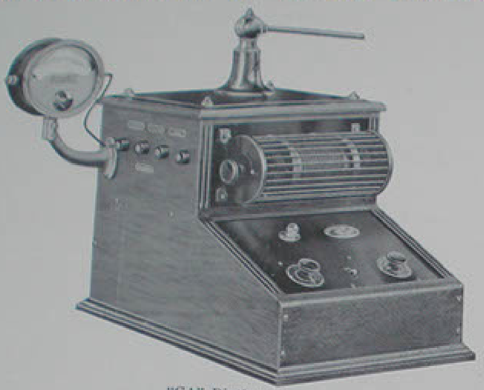
**EVERY
MODALITY
EFFICIENTLY PRODUCED**

**MOST
POWERFUL
DIATHERMY BUILT**

SPECIFICATIONS

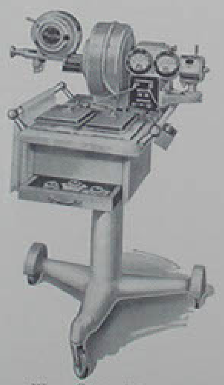
Catalogue		Price
16130	**MODEL "CI" DIATHERMY for use on 110 v., 60 c., A. C., with Cords, Cord Reels, Meter Bracket, etc. Mahogany finish, black and nickel trimmings**	$610.00
16102	Milliameter, Double Scale	35.00
16131	**MODEL "CI" DIATHERMY for use on 110 v. 60 c., A. C., Cat. No. 16130, and with Milliameter, Cat. No. 16102 (Code Word "Cimco")**	645.00
16132	**MODEL "CI" DIATHERMY, same as above and with Accessories listed Cat. No. 16106 to 16114 inclusive (Code Word "Cimplet")**	775.00
16104	Vacup Diathermy Clamps, set	22.00
16133	**MODEL "CI" DIATHERMY, same as 16132 and with Vacup Clamps. Special Price for Complete Outfit when ordered together**	785.00

An Ideal Equipment for the Busy Practitioner



"CA" Diathermy

The requirements of
Physical Therapy
are aptly met
with an equipment including
Campbell
Diathermy Generator
MODEL "CA"
as illustrated above
and
Morse Wave Generator



Morse Wave Generator

Morse Wave Generator

SPECIFICATIONS

Catalogue		Price
21250	"Morse" Wave Generator, Type A-25, complete for operation on 110 volt, 60 cycle current	$475.00
21251	Same at Cat. No. 21250 but for operation on 110 volt, D. C.	475.00
21252	Same as Cat. No. 21250 but for operation on 110 volt, 50 cycle current	475.00
21253	Same as Cat. No. 21250 but for operation on 110 volt, 40 cycle current	475.00
21254	Same as Cat. No. 21250 but for operation on 110 volt, 25 cycle current	475.00

Air and Vacuum Apparatus

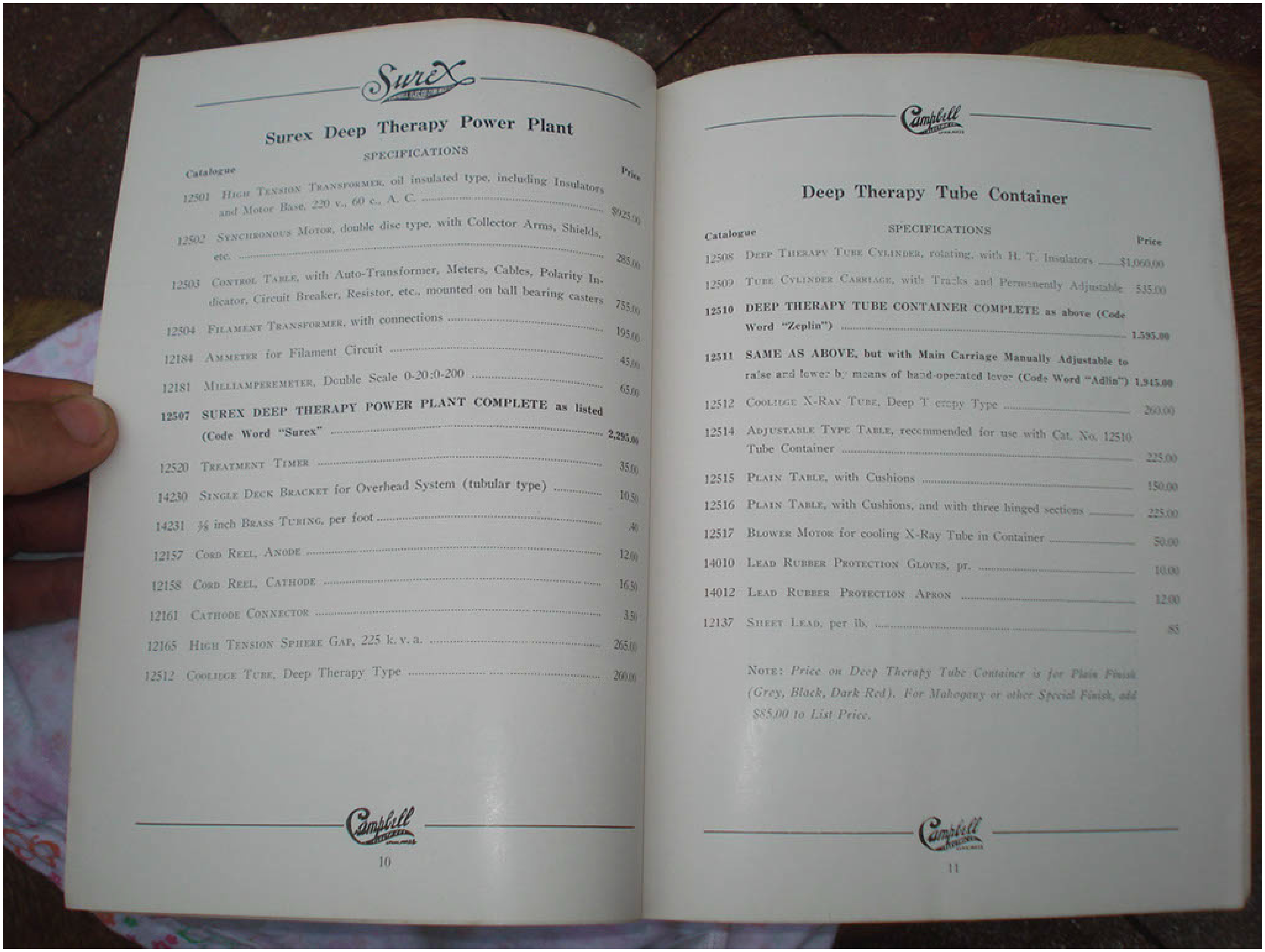
Furnished in gray enamel finish as standard
F. O. B. Cincinnati.

21150	Model CS Outfit, complete with suction and pressure gauges, monel metal top, heater bulbs, one instrument tray, three sprays, one nebulizer, two powder blowers, and glass-stoppered medicine bottles, 110 V. 60 cycles A. C.	$178.00
21151	Same as Cat. No. 21150 except for 220 V. 60 cycles A. C.	180.00
21152	Same as Cat. No. 21150 except for 25, 30, 40 or 50 cycles, 110 or 220 V. (specify cycles and voltage when ordering on this Cat. No.)	185.00
21153	Same as Cat. No. 21150 except for 110 V. D. C.	178.00
21154	Same as Cat. No. 21150 except for 220 V. D. C.	180.00
21160	Model CG Outfit, including all the standard equipment of the Model CS, and in addition: Air Heater, large and small Surface, Rectal Dilator, Rectal Electrode, two Rubber Cups, Glass Breast Suction Cup	195.00
21161	Same as Cat. No. 21160, except for 220 V. 60 cycles A. C.	197.00
21162	Same as Cat. No. 21160 except for 25, 30, 40, or 50 cycles, 110 or 220 V. (specify cycles and voltage when ordering on this Cat. No.)	202.00
21163	Same as Cat. No. 21160 except for 110 V. D. C.	195.00
21164	Same as Cat No. 21160 except for 220 V. D. C.	197.00

Accessories for Above

SPECIFICATIONS

Catalogue		Price
21170	Ether Vapor and Suction Outfit, consisting of white glass ether bottle with the necessary hose and applicator, and a large size amber glass suction catch bottle with necessary hose and applicator, both mounted on a heavy, non-tip metal base	$ 19.75
21171	Suction Bottle, only, consisting of large size amber glass suction catch bottle with necessary hose and applicator mounted on heavy non-tip metal base	10.75
21172	Sinus Cleanser, consisting of glass suction catch bottle with metal top, with nose piece directly connected	3.00
21173	Combination Positive and Negative Sinus Cleanser, consisting of two bottles, one being used as a suction bottle, the other the nebulizing bottle	15.00
18450	Air Heater	7.50
18469	Bottle Nest with Ruby Lamp Bulb 110 Volts, and Spray, Atomizer, Powder Blower, and three Storage Bottles	17.00



Surex Deep Therapy Power Plant

SPECIFICATIONS

Catalogue		Price
12501	High Tension Transformer, oil insulated type, including Insulators and Motor Base, 220 v., 60 c., A. C.	$925.00
12502	Synchronous Motor, double disc type, with Collector Arms, Shields, etc.	285.00
12503	Control Table, with Auto-Transformer, Meters, Cables, Polarity Indicator, Circuit Breaker, Resistor, etc., mounted on ball bearing casters	755.00
12504	Filament Transformer, with connections	195.00
12184	Ammeter for Filament Circuit	45.00
12181	Milliamperemeter, Double Scale 0-20:0-200	65.00
12507	**SUREX DEEP THERAPY POWER PLANT COMPLETE as listed (Code Word "Surex"**	**2,295.00**
12520	Treatment Timer	35.00
14230	Single Deck Bracket for Overhead System (tubular type)	10.50
14231	¾ inch Brass Tubing, per foot	.40
12157	Cord Reel, Anode	12.00
12158	Cord Reel, Cathode	16.50
12161	Cathode Connector	3.50
12165	High Tension Sphere Gap, 225 k. v. a.	265.00
12512	Coolidge Tube, Deep Therapy Type	260.00

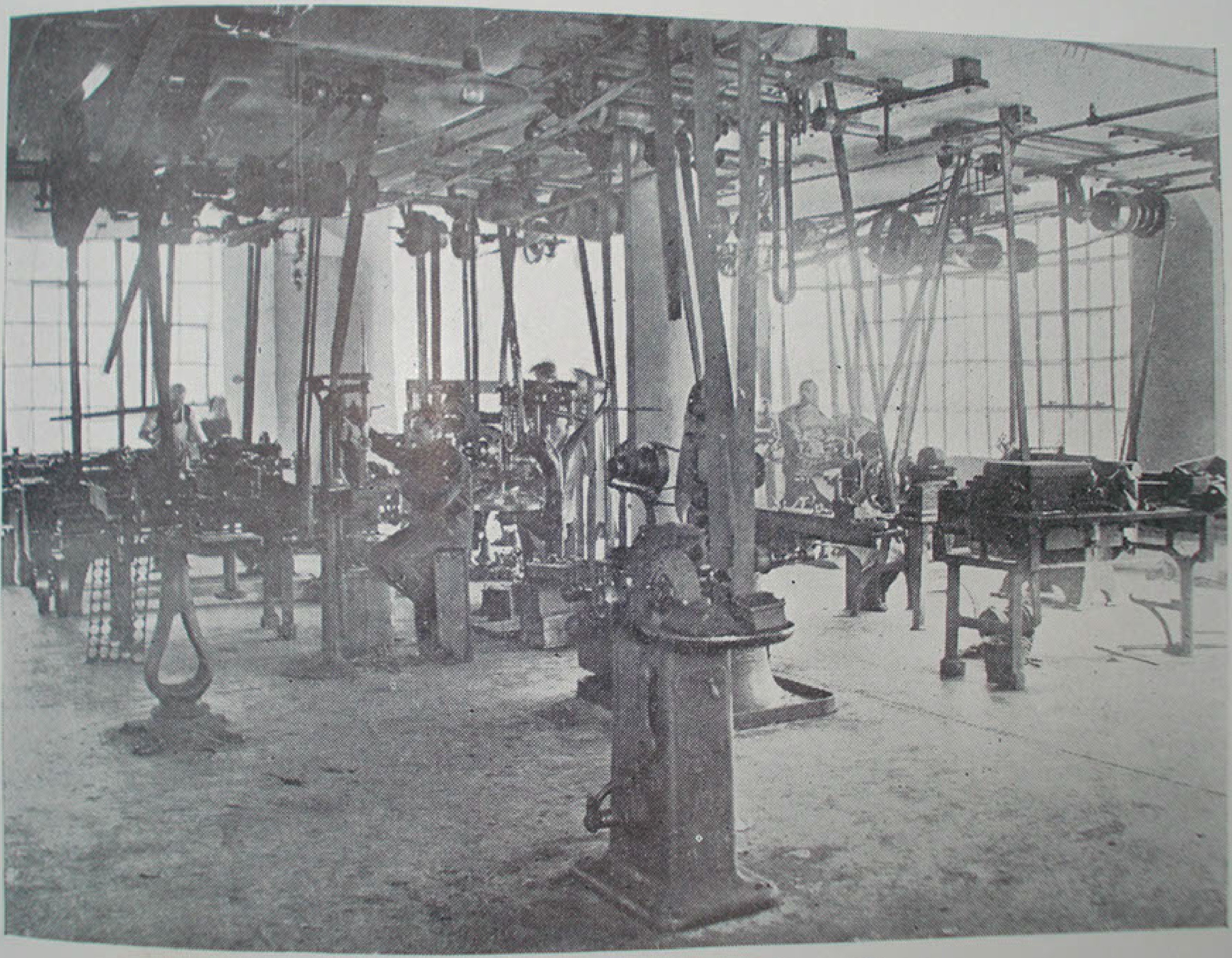
Deep Therapy Tube Container

SPECIFICATIONS

Catalogue		Price
12508	Deep Therapy Tube Cylinder, rotating, with H. T. Insulators	$1,060.00
12509	Tube Cylinder Carriage, with Tracks and Permanently Adjustable	535.00
12510	**DEEP THERAPY TUBE CONTAINER COMPLETE as above (Code Word "Zeplin")**	**1,595.00**
12511	**SAME AS ABOVE, but with Main Carriage Manually Adjustable to** raise and lower by means of hand-operated lever **(Code Word "Adlin")**	**1,945.00**
12512	Coolidge X-Ray Tube, Deep Therapy Type	260.00
12514	Adjustable Type Table, recommended for use with Cat. No. 12510 Tube Container	225.00
12515	Plain Table, with Cushions	150.00
12516	Plain Table, with Cushions, and with three hinged sections	225.00
12517	Blower Motor for cooling X-Ray Tube in Container	50.00
14010	Lead Rubber Protection Gloves, pr.	10.00
14012	Lead Rubber Protection Apron	12.00
12137	Sheet Lead, per lb.	.85

Note: *Price on Deep Therapy Tube Container is for Plain Finish (Grey, Black, Dark Red). For Mahogany or other Special Finish, add $85.00 to List Price.*

BUILDING



A Corner of Our Machine Shop

Model "CH" Portable Diathermy

Designed for Home Use of Patient

Catalogue	SPECIFICATIONS	Price
16141	**MODEL "CH" PORTABLE DIATHERMY for use on 110 v., 60 c., A. C., complete with Cords, Oudin Terminal, Spark Gap, Diathermy Metal, etc.; ready to operate**	$145.00

NOTE: *All standard accessories may be used with above outfit. For currents other than 110 v., 60 c., A. C., write for quotation.*

Rotary Converters

Catalogue	SPECIFICATIONS	Price
12121	ROTARY CONVERTER, 110 v. D. C. to 110 v. A. C., 10 amperes	$100.00
16148	ROTARY CONVERTER, 110 v. D. C. to 110 v. A. C., 20 amperes	175.00
16158	ROTARY CONVERTER, 110 v. D. C. to 80 v. A. C., 6 amperes	75.00

NOTE: *For prices on 220 Volt Rotary Converters, write us.*

Time Switches

Catalogue	SPECIFICATIONS	Price
12520	TREATMENT TIMER, Automatic	$35.00
15159	INTERVAL TIMER, Alarm Clock Type	5.00

Miscellaneous

Catalogue	SPECIFICATIONS	Price
16102	MILLIAMETER, Double Scale, 1500-3000 M. A.	$ 35.00
16114	CHAIR, for Treatments	85.00
16124	AUTO PAD, for Treatments	20.00
16108	FOOT SWITCH	15.00

Vacup Diathermy Clamps

Catalogue	SPECIFICATIONS	Price
16104	**VACUP DIATHERMY CLAMPS, per set**	$22.00
16200	ONE PAIR, Large Discs	8.00
16201	ONE PAIR, Medium Discs	5.50
16203	ONE PAIR, Small Discs	4.00
16204	ONE PAIR, Adapter Arms	2.75
16206	ONE ONLY, Short Spreader	.75
16207	ONE ONLY, Long Spreader	1.25

Coagulator Set

Catalogue	SPECIFICATIONS	Price
16107	**ELECTRO-COAGULATOR, per set**	$10.50
16208	HANDLE, only	6.50
16209	CORD, insulated	1.50
16210	NEEDLE, Knife Type	.75
16211	NEEDLE, Point Type	.75
16212	NEEDLE, Disc Type	1.00

Fulgerator Set

Insulated Type

Positive Action

Catalogue	SPECIFICATIONS	Price
16106	**ELECTRO-FULGERATOR, per set**	$6.50
16213	FULGERATOR, Handle only	5.00
16214	NEEDLE, Knife Type	.50
16215	NEEDLE, Pointed Type	.50
16216	NEEDLE, Ball Type	.50

Diathermy Metal

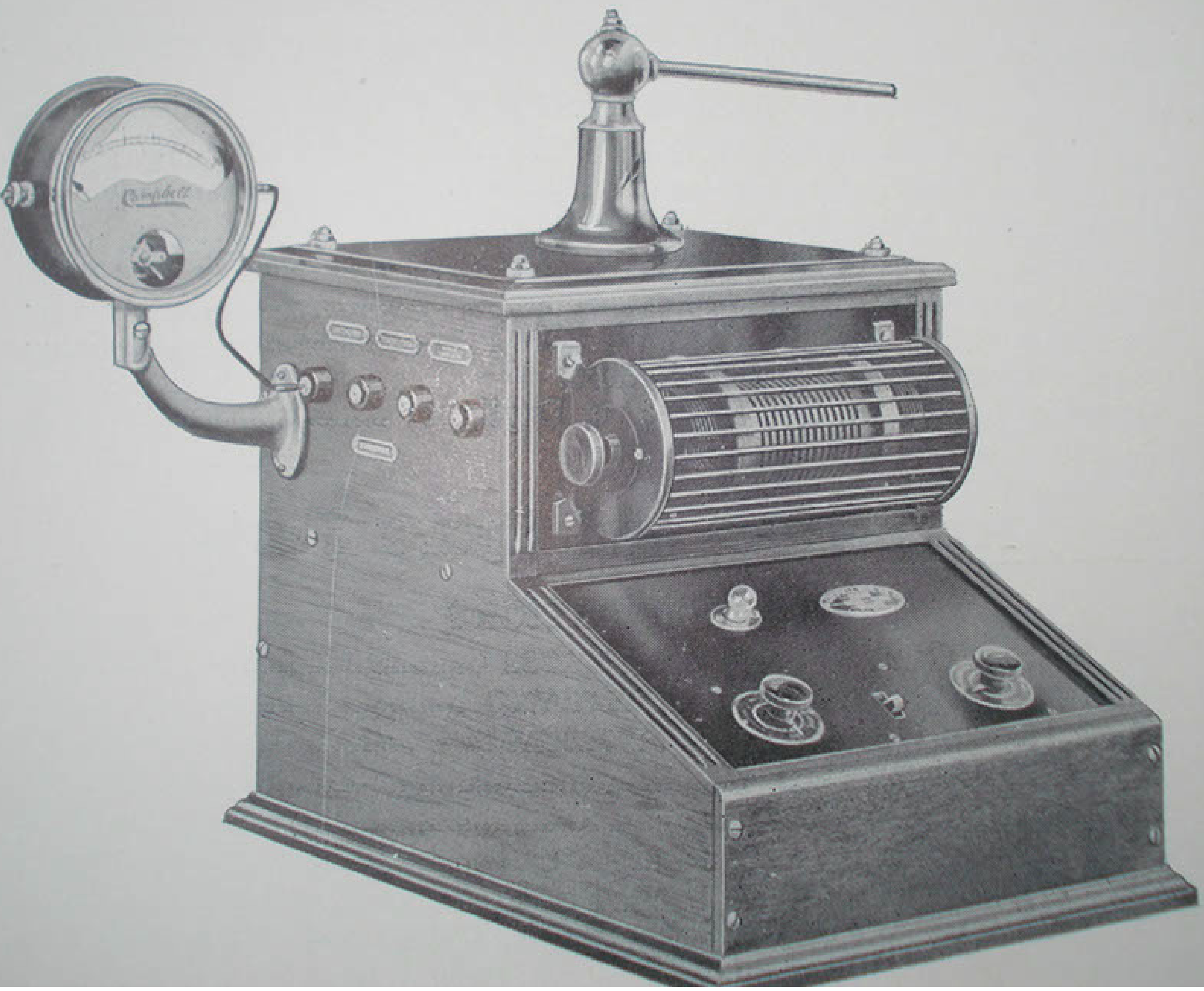
Catalogue	SPECIFICATIONS	Price
16220	**DIATHERMY METAL, per roll**	$2.50

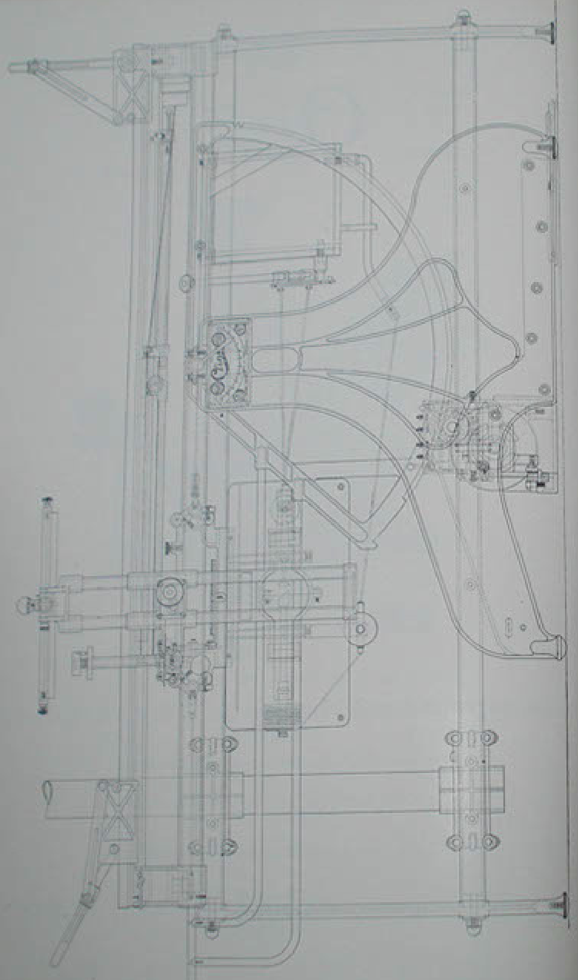
Roller
Free with full
roll of metal

Cords
$3.00 per set
Cat. No. 18000

Campbell
Electric Co.
Lynn Mass

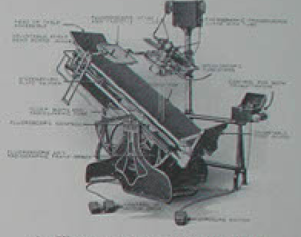
An Ideal Equipment for the Busy Practitioner





Clinix X-Ray Plant

Self-excited **COMPLETE** **Self-contained**



As Illustrated, Catalogue No. 12120

Trolleyless X-Ray Plant Clinix **Complete X-Ray Unit**

Clinix X-Ray Plant, 110 Volts, 60 Cycles, A. C.

Catalogue	SPECIFICATIONS	Price
12100	Campbell Clinix Tube Tilt Table Only, for use with separate exciting equipment and including Fluoroscopic Screen and Holder, Cord Reels, Lead Glass Shield or Bowl under Table, Foot Rest, etc.	$1,200.00
12101	Tube Stand Rails with End Castings	50.00
12102	Motor Drive (reversible), with Foot Switches	175.00
12103	Fluoroscopic Transformer, attached under Table, Reels, etc.	300.00
12104	Radiographic Transformer, with Mountings, Reels, etc.	350.00
12105	Universal No. Six Tube Stand with Lead Glass Shield or Bowl, Carriers for Rail Mounting, Platform for Transformer, etc.	310.00

(Continued on next page)

Florex (Fluoroscopic) X-Ray Unit

SPECIFICATIONS

Catalogue		Price
12130	Transformer, with Posts	$ 270.00
12106	Control Case, with Auto-Transformer, Meters, Cords, Rheostat, etc.	115.00
12107	Foot Switch	15.00
12159	Mobile Base for Control Case or Attachment Bracket	20.00
12160	**FLOREX (Fluoroscopic) X-RAY UNIT COMPLETE as listed (Code Word "Florex")**	**395.00**

FLOREX X-RAY UNIT

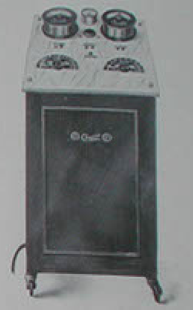
Vertical Fluoroscope

SPECIFICATIONS

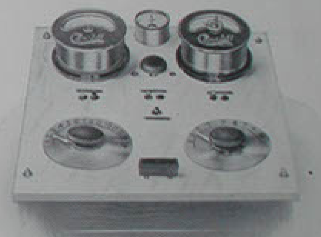
Catalogue		Price
13150	**VERTICAL FLUOROSCOPE, including Shutter Mechanism, Lead Glass Shield, Screen, etc., fully counterbalanced**	**$450.00**
12112	Coolidge X-Ray Tube, radiator type	125.00
12160	Florex (Fluoroscopic) Power Unit	395.00
13151	**VERTICAL FLUOROSCOPE UNIT COMPLETE as above (Code Word "Flovert")**	**950.00**
14010	Lead Rubber Protection Gloves, 1	10.00
14012	Lead Rubber Protection Apron	12.00
12121	Rotary Converter for use on D. C.	100.00

Note: *For Tilting Fluoroscope prices, see Clinix List, Page One, Catalogue Number* 12100.

**For operation on
220 V., 60 C., A. C.**



**200,000 Peak Volts
0—200 Milamps.**



**DEEP
THERAPY**

**POWER
PLANT**

Surex
CAMPBELL ELEC. CO. LYNN, MASS. U.S.A.

For price list, see next page

Kromayer Lamps

Direct Current Equipment, 110 V., or 220 V.

Catalogue	SPECIFICATIONS	Price
22001	On movable floor stand, complete and ready for use, including two eight foot rubber tube water connections, lamp socket attachment plug, mica protection window and two pair of goggles. Exclusive of applicators	$ 385.00
22055	Bedside Unit Lamp, self contained cooling system, with automatic control. Exclusive of applicators	715.00
22057	On wall bracket, complete and ready for use, including two eight foot rubber tube water connections, lamp socket attachment plug, mica protection window and two pair of goggles. Exclusive of applicators	385.00
22212	Portable Self-Contained Unit, self-suspending lamp (Kromayer Gooseneck)	520.00

Combination Units

Alternating Current Equipment, 110 V., or 220 V., 60 Cy.

Catalogue	SPECIFICATIONS	Price
22028	Combination of Kromayer Lamp and Alpine Sun Lamp, complete, each on separate stand and using same transformer. Exclusive of applicators	$ 795.00
22213	Portable Self-contained Unit, combination of Kromayer and Alpine Sun Lamp (fitted with two uprights and using Kromayer Goose-neck)	910.00
	Rack and Pinion adjustment will be furnished for the Kromayer Burner in place of the Goose-neck without extra charge when so specified.	
22215	Bedside Combination Unit, Kromayer Lamp and Alpine Sun Lamp	1,120.00

For other than 60 Cycle equipment, add $50.00 to price

Combination Lamps

Direct Current Equipment, 110 V., or 220 V.

Catalogue	SPECIFICATIONS	Price
22021	On movable floor stand, consists of Kromayer Lamp, complete at 22001, with Alpine Sun Lamp attached on same upright, and using same rheostat	$ 610.00
22206	Consists of Kromayer Lamp and Alpine Sun Lamp complete, each on separate floor stand, and using the same rheostat. Exclusive of applicators	660.00
22216	Bedside unit combination of Kromayer and Alpine Sun Lamps	990.00
22129	Portable Self-contained Unit, Combination of Kromayer and Alpine Sun Lamps (fitted with two uprights and using Kromayer Goose-neck)	775.00
	Rack and Pinion adjustment will be furnished for the Kromayer Burner in place of the Goose-neck without extra charge when so specified.	

Luxor Lamps

Catalogue	SPECIFICATIONS	Price
22301	On stand, complete with transformer, lamp socket attachment plug, leads and two pair of goggles. For 110 V., or 220 V., 60 Cy.	$ 300.00
22300	On stand, complete with rheostat, lamp socket attachment plug, leads and two pair of goggles. For use on 110 V., or 220 V., D. C.	215.00

Reserve Burners

For Alternating Currents, 60 Cy.

Catalogue	SPECIFICATIONS	Price
22038	Alpine Sun Lamp Burner	$ 200.00
22023	Kromayer Burner, in case complete	255.00
	For Direct Currents, 110 V., or 220 V.	
22037	Alpine Sun Lamp Burner	128.00
22020	Kromayer Burner, in case complete	175.00

Sollux Lamps

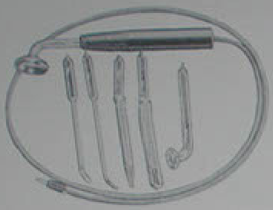
Operate universally on A. C. or D. C. In ordering state voltage required.

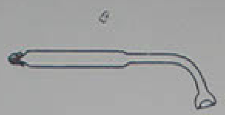
Catalogue	SPECIFICATIONS	Price
22217	Floor Stand Type (1000 W. Bulb)	$ 125.00
	Small Cone Reflector for local radiation	7.50
	Filters for use with floor stand type Sollux: a. Blue Light; b. Red Light; c. Daylight; each	3.00
	Filter Carrying Frame	7.00
22218	Desk Type Sollux Lamp (300 W. Bulb)	65.00
	Filters for use with desk type Sollux: a. Blue Light; b. Red Light; c. Daylight; each	2.20

Applicators and Spare Parts

Catalogue	SPECIFICATIONS	Price
22002	Small Round Quartz Lens Applicator	$ 20.00
22003	Large Square Quartz Lens Applicator	27.00
22004	Medium Round Quartz Lens Applicator	23.00
22005	Hemorrhoid Applicator	36.50
22006	Holder for Quartz Rods	7.50
22007	Quartz Rod, 2¼" long with straight end	12.00
22008	Quartz Rod, 6¼" long with shaped end	24.00
22009	Blue "Ultra Violet Glass" Filters, 2, 3, 4, 5 mm. thick, each	6.00
22010	Mica Protecting Window	1.00
22011	Weaver Applicator	13.50
22012	Rubber Tubing, per foot	.30
22014	Quartz Lamp Window	6.50
22015	Sharpe Localizer with 3 tubes	7.00
22016	Sinus Applicator (McManus)	$ 7.50
22017	Plank Proctoscope	9.75
22018	Pharyngeal Applicator (Plank)	19.00
22019	Baldwin Laryngoscope for Alpine Sun Lamp	38.00
22024	Blue Window (complete)	10.50
22025	Burrow's Prostatic Applicator	10.50
22026	Rubber Tube Clamp	1.25
22027	Mehler Nasal Applicator	24.00
22050	Hanovia Interval Timer	5.50
22029	Protection Goggles, per pr.	.40
22222	Infants' Protection Goggles, per pair	.40
22120	Ladabeck Quartz Irrigators, per set of four	103.00
22127	Mayer Aural Applicator	15.00
22128	Wagner Quartz Specula, per set of three	90.00
22150	McCaskey's Prostatic Applicator	36.00
22152	Sampson Pyorrhea Applicators, set of three	32.50
22153	Sampson Hay Fever Applicator	24.00
22154	Sampson Laryngoscope	38.00
22201	Urethral Applicator	32.00
22202	Wagner Prismatic Reflector, ¼ inch	36.00
22203	Wagner Prismatic Reflector, ½ inch	36.00
22204	Wagner Prismatic Reflector, ¾ inch	36.00
22205	Ashland Universal Pyorrhea Applicator, each	26.50
22221	Special Mobile Base (for Alternating Current Lamps only) Separately	15.00

Vacuum Electrodes





Catalogue	SPECIFICATIONS	Price
16112	Single Eye Electrode	$ 3.00
16113	Double Eye Electrode	4.00
16109	Vacuum Electrode Handle	6.50
16110	Vacuum Electrodes, Set of Six	7.50
16221	Surface Electrode, Plain Type	1.50
16222	Nasal Electrode, Plain Type	1.50
16223	Urethral Electrode, Plain Type	1.50
16224	Throat Electrode, Plain Type	1.50
16225	Rectal Electrode, Plain Type	1.50
16226	Vaginal Electrode, Plain Type	1.50
16231	Ear Electrode, Insulated Type	2.50
16232	Nasal Electrode, Insulated Type	2.00
16233	Urethral Electrode, Insulated Type	2.00
16234	Tongue Electrode, Insulated Type	2.50
16235	Rectal Electrode, Insulated Type	2.00
16236	Vaginal Electrode, Insulated Type	2.00
16237	Post Nasal Electrode, Insulated Type	2.50
16227	Cataphoroic Electrode	4.50
16228	Condenser Electrode	4.50
16241	Pyorrhea Electrode, Dental Type	1.50
16242	Cavity Electrode, Dental Type	1.50
16243	Gum Electrode, Dental Type	2.00
16244	Localizing Electrode, Dental Type	2.00
16245	Pulp Electrode, Dental Type	1.00

Special Diathermy Electrodes

Catalogue	SPECIFICATIONS	Price
22250	Metal Prostatic Electrode	$ 3.50
22251	Metal Vaginal Electrode (plain)	3.50
22252	Metal Vaginal Electrode (with depression for cervix)	3.50
22253	Corbus Cervical Thermophore, with thermometer	12.00
22257	Corbus Cervical Thermophore, without thermometer	9.50

Alpine Sun Lamps

Alternating Current Equipment, 110 V., or 220 V., 60 Cy.

Catalogue	SPECIFICATIONS	Price
22031	On movable floor stand, complete with transformer, lamp socket attachment plug, leads, and two pair of goggles	$ 435.00
22033	On wall bracket, complete with transformer, plug, leads and two pair of goggles	435.00
22035	On ceiling suspension, complete with transformer, plug, leads and two pair of goggles	390.00
22210	Complete, with special mobile base	440.00
22040	Lamp without transformer to complete combination unit 22028	300.00
22041	Lamp without transformer or floor stand for direct attachment to unit 22022 to make combination unit on one stand	275.00

For other than 60 Cycle equipment, add $50.00 to price

Alpine Sun Lamps

Direct Current Equipment, 110 V., or 220 V.

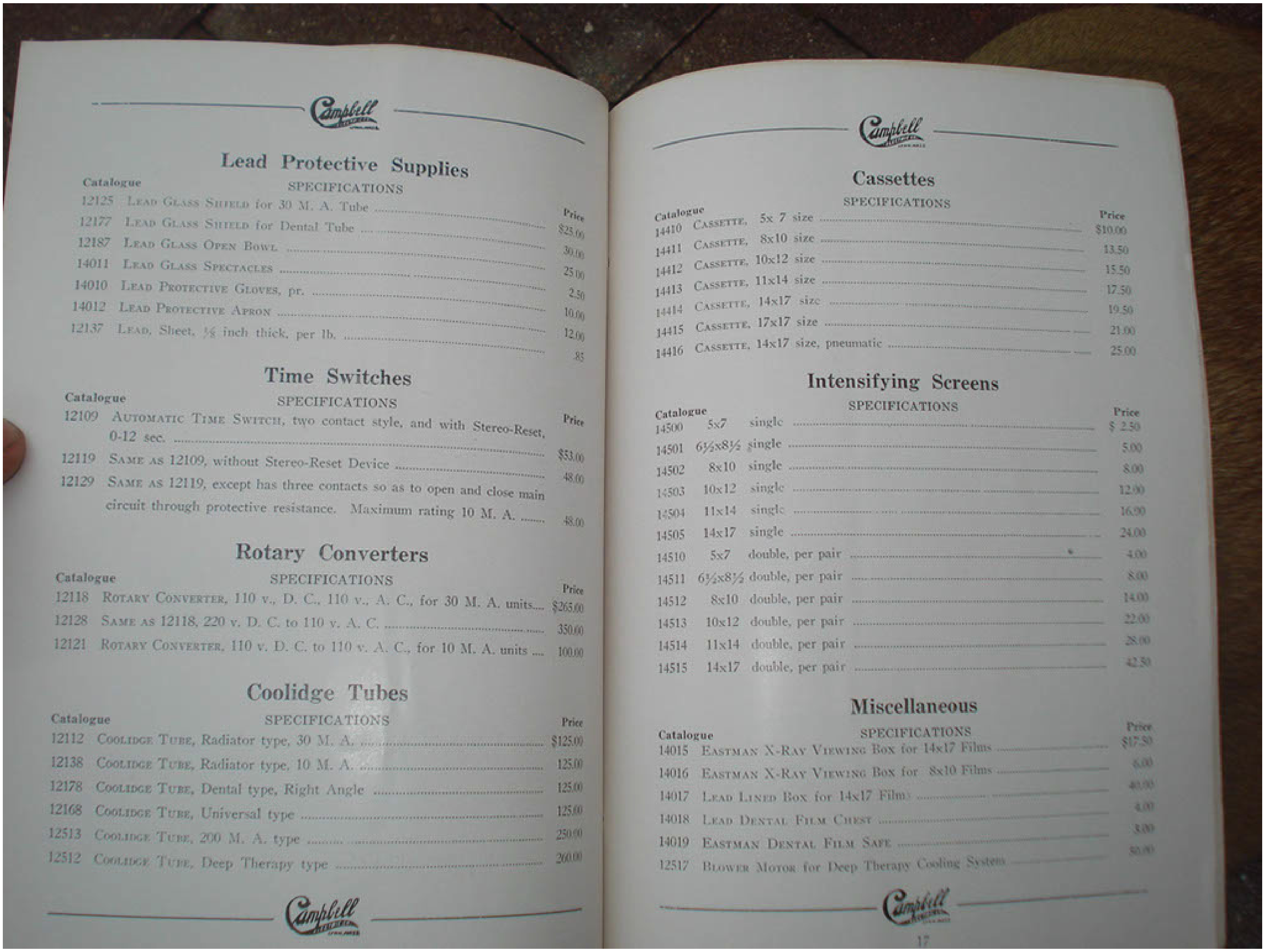
Catalogue	SPECIFICATIONS	Price
22030	On movable floor stand, complete with rheostat, lamp socket attachment plug, leads, and two pair of goggles	$ 315.00
22032	On wall bracket, complete with rheostat, plug, leads and two pair of goggles	315.00
22034	Ceiling suspension lamp, complete with rheostat, plug, leads, and two pair of goggles	275.00
22036	Movable floor stand lamp, without rheostat, for direct attachment to Kromayer Lamp (to complete combination 22206)	275.00
22039	Lamp without stand or rheostat for attachment to Kromayer to complete combination unit 22021	225.00

Kromayer Lamps

Alternating Current Equipment, 110 V., or 220 V., 60 Cy.

Catalogue	SPECIFICATIONS	Price
2202	On movable floor stand, complete with two eight foot rubber tube water connections, lamp socket attachment plug, mica protection window and two pair of goggles. Exclusive of applicators	$ 495.00
[illegible]	On wall bracket, complete and ready for use, including two eight foot rubber tube water connections, transformer, lamp socket attachment plug, mica protection window, and two pair of goggles. Exclusive of applicators	495.00
[illegible]	Bedside Unit, self-contained cooling system, with automatic control. Exclusive of applicators	825.00
[illegible]	Portable Self-Contained Unit, Self-suspending lamp (Kromayer-Gooseneck)	615.00

For other than 60 Cycle equipment, add $50.00 to price



Lead Protective Supplies

Catalogue	SPECIFICATIONS	Price
12125	Lead Glass Shield for 30 M. A. Tube	$25.00
12177	Lead Glass Shield for Dental Tube	30.00
12187	Lead Glass Open Bowl	25.00
14011	Lead Glass Spectacles	2.50
14010	Lead Protective Gloves, pr.	10.00
14012	Lead Protective Apron	12.00
12137	Lead, Sheet, ⅛ inch thick, per lb.	.85

Time Switches

Catalogue	SPECIFICATIONS	Price
12109	Automatic Time Switch, two contact style, and with Stereo-Reset, 0-12 sec.	$53.00
12119	Same as 12109, without Stereo-Reset Device	48.00
12129	Same as 12119, except has three contacts so as to open and close main circuit through protective resistance. Maximum rating 10 M. A.	48.00

Rotary Converters

Catalogue	SPECIFICATIONS	Price
12118	Rotary Converter, 110 v., D. C., 110 v., A. C., for 30 M. A. units	$265.00
12128	Same as 12118, 220 v. D. C. to 110 v. A. C.	350.00
12121	Rotary Converter, 110 v. D. C. to 110 v. A. C., for 10 M. A. units	100.00

Coolidge Tubes

Catalogue	SPECIFICATIONS	Price
12112	Coolidge Tube, Radiator type, 30 M. A.	$125.00
12138	Coolidge Tube, Radiator type, 10 M. A.	125.00
12178	Coolidge Tube, Dental type, Right Angle	125.00
12168	Coolidge Tube, Universal type	125.00
12513	Coolidge Tube, 200 M. A. type	250.00
12512	Coolidge Tube, Deep Therapy type	260.00

Cassettes

Catalogue	SPECIFICATIONS	Price
14410	Cassette, 5x 7 size	$10.00
14411	Cassette, 8x10 size	13.50
14412	Cassette, 10x12 size	15.50
14413	Cassette, 11x14 size	17.50
14414	Cassette, 14x17 size	19.50
14415	Cassette, 17x17 size	21.00
14416	Cassette, 14x17 size, pneumatic	25.00

Intensifying Screens

Catalogue	SPECIFICATIONS		Price
14500	5x7	single	$ 2.50
14501	6½x8½	single	5.00
14502	8x10	single	8.00
14503	10x12	single	12.00
14504	11x14	single	16.00
14505	14x17	single	24.00
14510	5x7	double, per pair	4.00
14511	6½x8½	double, per pair	8.00
14512	8x10	double, per pair	14.00
14513	10x12	double, per pair	22.00
14514	11x14	double, per pair	28.00
14515	14x17	double, per pair	42.50

Miscellaneous

Catalogue	SPECIFICATIONS	Price
14015	Eastman X-Ray Viewing Box for 14x17 Films	$17.50
14016	Eastman X-Ray Viewing Box for 8x10 Films	6.00
14017	Lead Lined Box for 14x17 Films	40.00
14018	Lead Dental Film Chest	4.00
14019	Eastman Dental Film Safe	3.00
12517	Blower Motor for Deep Therapy Cooling System	50.00

"CA" Diathermy

ements of

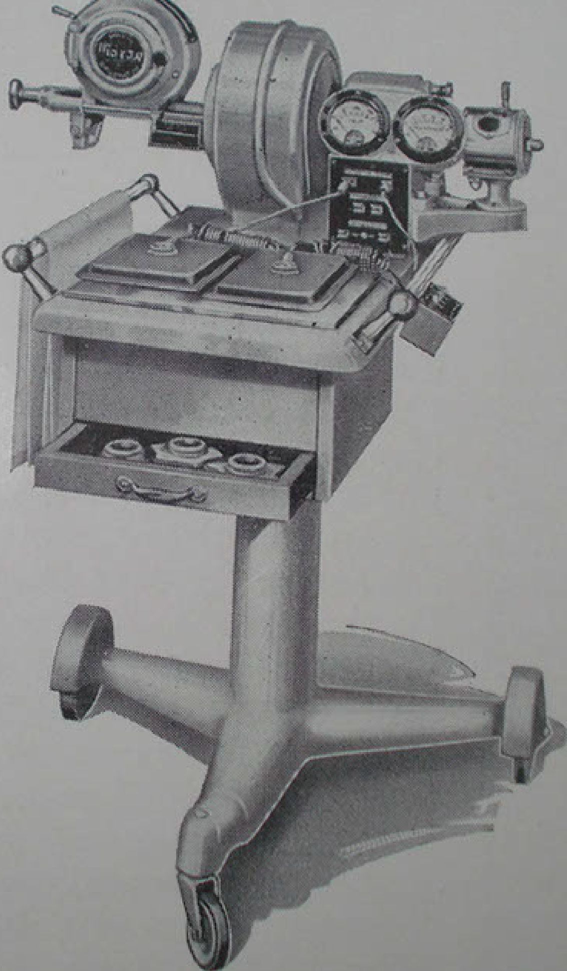
Therapy

y met
ent including

bell
Generator

"CA"
d above

Generator



Morse Wave Generator

2116
2116

2116
2116

Cat

211

211

211

211

184
184

New York State Hospital
Ray Brook, N.Y.

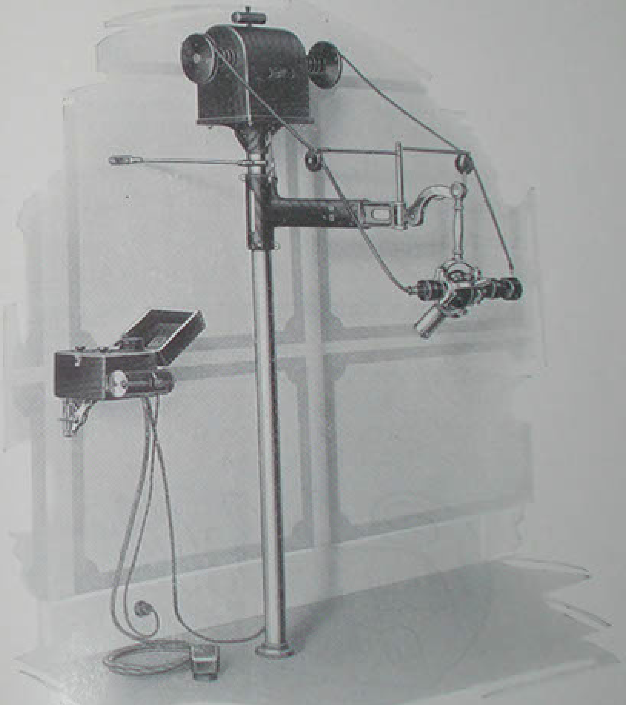
Leading Roentgenologists and Institutions throughout the world use and recommend

Campbell Roentgen Equipment

Pictured here are two of the thousands of institutions equipped with our apparatus

New England Hospital
for Women and Children

Model "OH" X-Ray Power Plant



Catalogue	SPECIFICATIONS	Price
12245	Transformer with Mountings, etc.	$385.00
12106	Control Case, with Auto-Transformer, Cords, Rheostat, etc.	115.00
12107	Foot Switch	15.00
12171	Tube Stand, Crane type for wall mounting	235.00
12125	Lead Glass Shield for Tube	25.00
12112	Coolidge X-Ray Tube, radiator type	125.00
12170	**MODEL "OH" X-RAY POWER PLANT COMPLETE as listed (Code Word "Crano")**	[illegible]

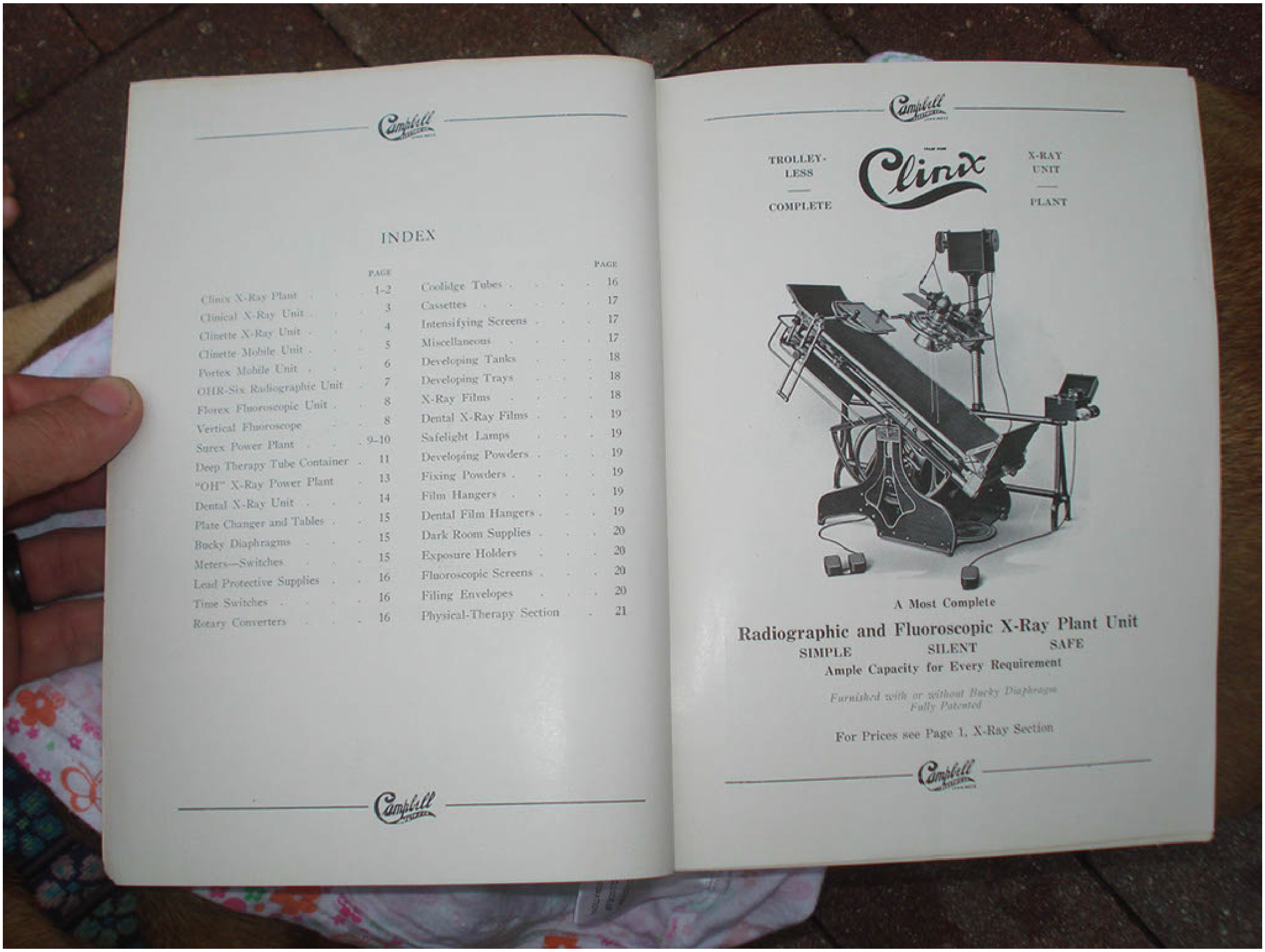
PRICE LIST

X-RAY AND PHYSICAL-THERAPY
APPARATUS

ACCESSORIES AND SUPPLIES

Campbell

CAMPBELL ELECTRIC MFG. CO.
Campbell Building 15-19 Stewart Street
LYNN, MASSACHUSETTS



INDEX

	PAGE
Clinix X-Ray Plant	1–2
Clinical X-Ray Unit	3
Clinette X-Ray Unit	4
Clinette Mobile Unit	5
Portex Mobile Unit	6
OHR-Six Radiographic Unit	7
Florex Fluoroscopic Unit	8
Vertical Fluoroscope	8
Surex Power Plant	9–10
Deep Therapy Tube Container	11
"OH" X-Ray Power Plant	13
Dental X-Ray Unit	14
Plate Changer and Tables	15
Bucky Diaphragms	15
Meters—Switches	15
Lead Protective Supplies	16
Time Switches	16
Rotary Converters	16
Coolidge Tubes	16
Cassettes	17
Intensifying Screens	17
Miscellaneous	17
Developing Tanks	18
Developing Trays	18
X-Ray Films	18
Dental X-Ray Films	19
Safelight Lamps	19
Developing Powders	19
Fixing Powders	19
Film Hangers	19
Dental Film Hangers	19
Dark Room Supplies	20
Exposure Holders	20
Fluoroscopic Screens	20
Filing Envelopes	20
Physical-Therapy Section	21

TROLLEY-LESS — COMPLETE

Clinix

X-RAY UNIT — PLANT

A Most Complete

Radiographic and Fluoroscopic X-Ray Plant Unit

SIMPLE SILENT SAFE

Ample Capacity for Every Requirement

Furnished with or without Bucky Diaphragm
Fully Patented

For Prices see Page 1, X-Ray Section

Dark Room Supplies

Catalogue	SPECIFICATIONS	Price
15153	DENTAL FILM DEVELOPING CABINET COMPLETE	$75.00
15154	TANK UNIT ONLY, including four Hangers	15.00
15155	DENTAL FILM DEVELOPING TANK, 12 oz. size, with Lid	.75
15156	HANGER, No. 5, with six Clips, for above	.75
15157	COMBINATION (15155-56) together	1.35
15158	THERMOMETER	.50
15159	INTERVAL TIMER	5.00
15160	THERMOMETER STIRRING ROD	1.25
15161	DENTAL FILM MOUNTS, per 100	2.00
15162	DENTAL FILM MOUNTS for use with Bit Wing Technique, per 100	6.00

Exposure Holders

Catalogue	SPECIFICATIONS	Price
15163	5x7 size, each	$ .15
15164	6½x8½ size, each	.25
15165	8x10 size, each	.30
15166	10x12 size, each	.35
15167	11x14 size, each	.40
15168	14x17 size, each	.50

Fluoroscopic Screens

Catalogue	SPECIFICATIONS	Price
15170	5x7 HAND FLUOROSCOPE, mounted	$25.00
15171	11x14 FLUOROSCOPE, framed	85.00
15172	FLUOROSCOPE SCREEN ONLY, 5x7	10.00
15173	FLUOROSCOPE SCREEN ONLY, 8x10	20.00
15174	FLUOROSCOPE SCREEN ONLY, 10x12	30.00
15175	FLUOROSCOPE SCREEN ONLY, 11x14	38.00
15176	FLUOROSCOPE SCREEN ONLY, 12x16	48.00
15177	FLUOROSCOPE SCREEN ONLY, 14x17	60.00

Filing Envelope

Catalogue	SPECIFICATIONS	Price
15178	5x7 , per 100	$ .55
15179	6½x8½, per 100	.75
15180	8x10 , per 100	1.00
15181	10x12, per 100	1.25
15182	11x14, per 100	1.50
15183	14x17, per 100	2.50

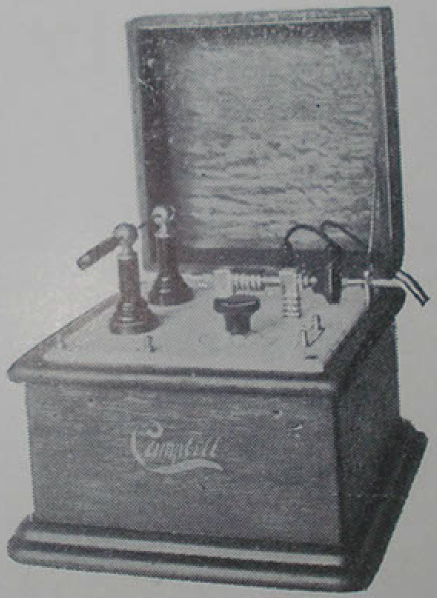
PHYSICAL-THERAPY SECTION

ELECTRIC CO.
LYNN, MASS.

APPARATUS
ACCESSORIES-SUPPLIES

Campbell
ELECTRIC CO.
LYNN, MASS.

Model "CH" Portable Diathermy



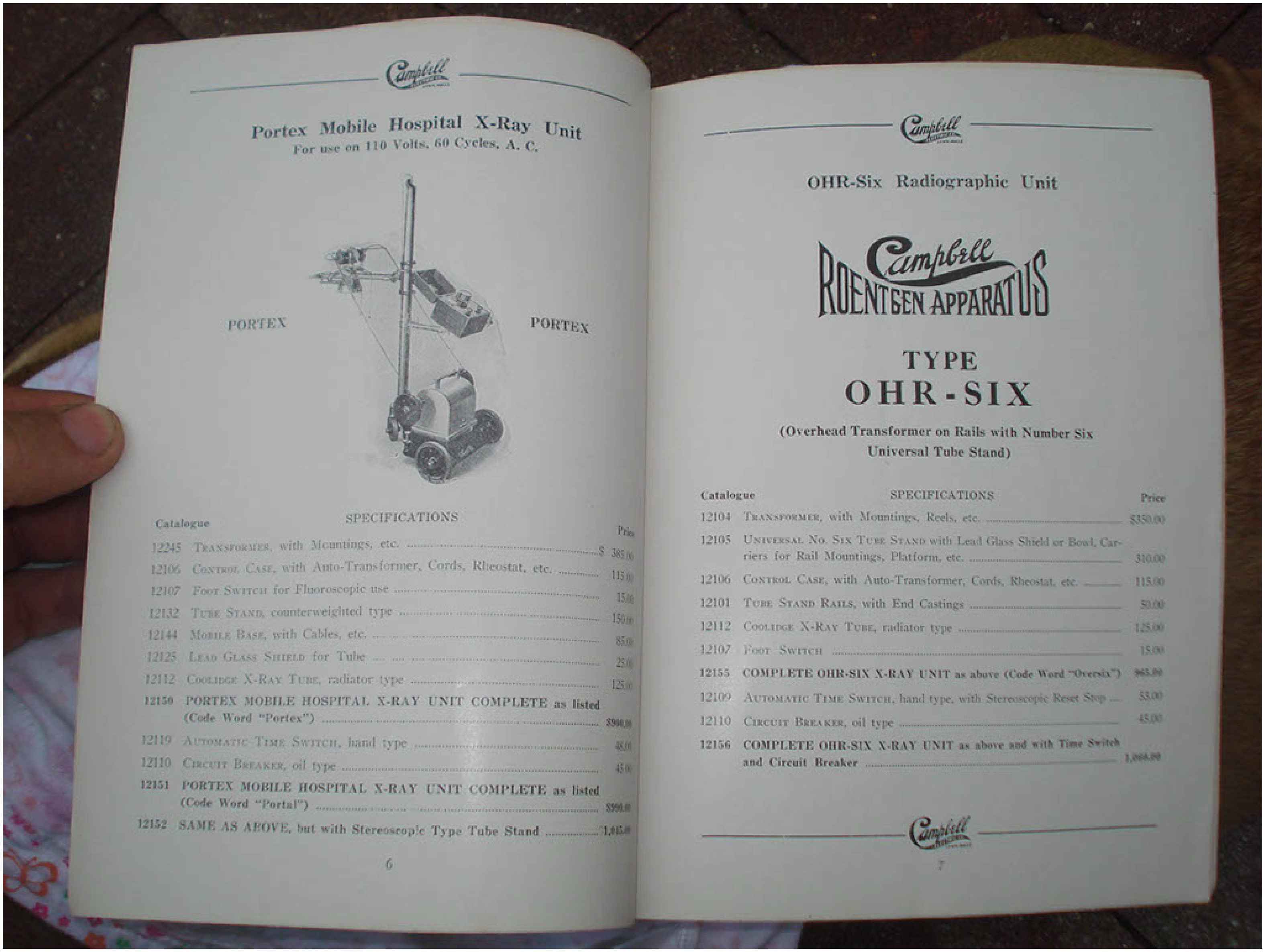
Designed for Home Use of Patient

Price

alogue

SPECIFICATIONS

DIATHERMY for use on 110 v., 60 c.,



Portex Mobile Hospital X-Ray Unit

For use on 110 Volts, 60 Cycles, A. C.

PORTEX PORTEX

Catalogue	SPECIFICATIONS	Price
12245	Transformer, with Mountings, etc.	$ 385.00
12106	Control Case, with Auto-Transformer, Cords, Rheostat, etc.	115.00
12107	Foot Switch for Fluoroscopic use	15.00
12132	Tube Stand, counterweighted type	150.00
12144	Mobile Base, with Cables, etc.	85.00
12125	Lead Glass Shield for Tube	25.00
12112	Coolidge X-Ray Tube, radiator type	125.00
12150	**PORTEX MOBILE HOSPITAL X-RAY UNIT COMPLETE as listed (Code Word "Portex")**	**$900.00**
12119	Automatic Time Switch, hand type	48.00
12110	Circuit Breaker, oil type	45.00
12151	**PORTEX MOBILE HOSPITAL X-RAY UNIT COMPLETE as listed (Code Word "Portal")**	**$990.00**
12152	**SAME AS ABOVE, but with Stereoscopic Type Tube Stand**	**1,045.00**

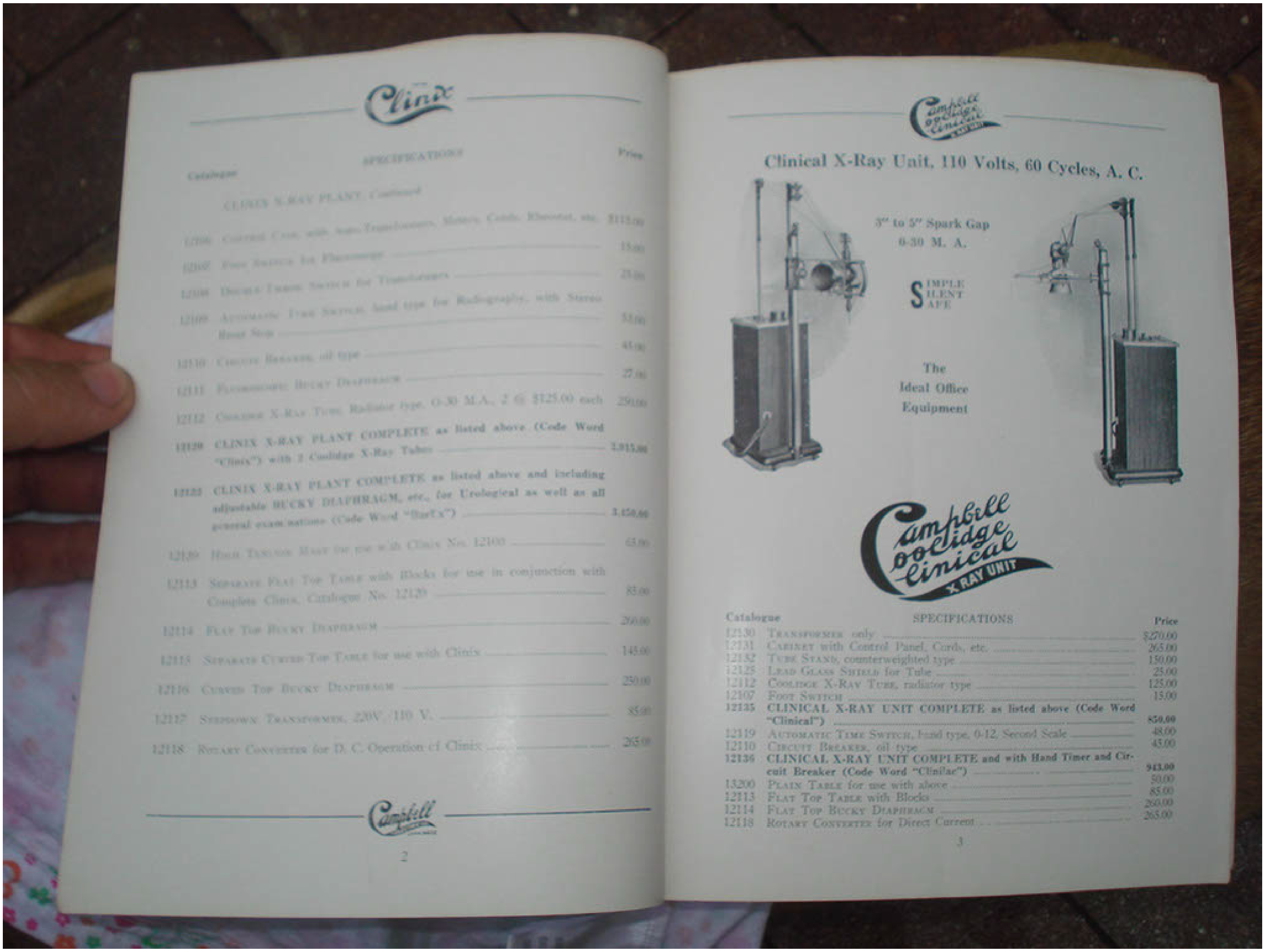
OHR-Six Radiographic Unit

Campbell
ROENTGEN APPARATUS

TYPE
OHR-SIX

(Overhead Transformer on Rails with Number Six Universal Tube Stand)

Catalogue	SPECIFICATIONS	Price
12104	Transformer, with Mountings, Reels, etc.	$350.00
12105	Universal No. Six Tube Stand with Lead Glass Shield or Bowl, Carriers for Rail Mountings, Platform, etc.	310.00
12106	Control Case, with Auto-Transformer, Cords, Rheostat, etc.	115.00
12101	Tube Stand Rails, with End Castings	50.00
12112	Coolidge X-Ray Tube, radiator type	125.00
12107	Foot Switch	15.00
12155	**COMPLETE OHR-SIX X-RAY UNIT as above (Code Word "Oversix")**	**965.00**
12109	Automatic Time Switch, hand type, with Stereoscopic Reset Stop	53.00
12110	Circuit Breaker, oil type	45.00
12156	**COMPLETE OHR-SIX X-RAY UNIT as above and with Time Switch and Circuit Breaker**	**1,060.00**



Catalogue	SPECIFICATIONS	Price
	CLINIX X-RAY PLANT, *Continued*	
12106	Control Case, with Auto-Transformers, Meters, Cords, Rheostat, etc.	$115.00
12107	Foot Switch for Fluoroscope	15.00
12108	Double Throw Switch for Transformers	25.00
12109	Automatic Time Switch, hand type for Radiography, with Stereo Reset Stop	55.00
12110	Circuit Breaker, oil type	45.00
12111	Fluoroscopic Bucky Diaphragm	27.00
12112	Coolidge X-Ray Tube, Radiator type, 0-30 M.A., 2 @ $125.00 each	250.00
12120	**CLINIX X-RAY PLANT COMPLETE as listed above (Code Word "Clinix") with 2 Coolidge X-Ray Tubes**	**2,015.00**
12121	**CLINIX X-RAY PLANT COMPLETE as listed above and including adjustable BUCKY DIAPHRAGM, etc., for Urological as well as all general examinations (Code Word "[illegible]")**	**3,450.00**
12130	High Tension Mast for use with Clinix No. 12100	65.00
12113	Separate Flat Top Table with Blocks for use in conjunction with Complete Clinix, Catalogue No. 12120	85.00
12114	Flat Top Bucky Diaphragm	200.00
12115	Separate Curved Top Table for use with Clinix	145.00
12116	Curved Top Bucky Diaphragm	250.00
12117	Stepdown Transformer, 220V./110 V.	85.00
12118	Rotary Converter for D. C. Operation of Clinix	265.00

Clinical X-Ray Unit, 110 Volts, 60 Cycles, A. C.

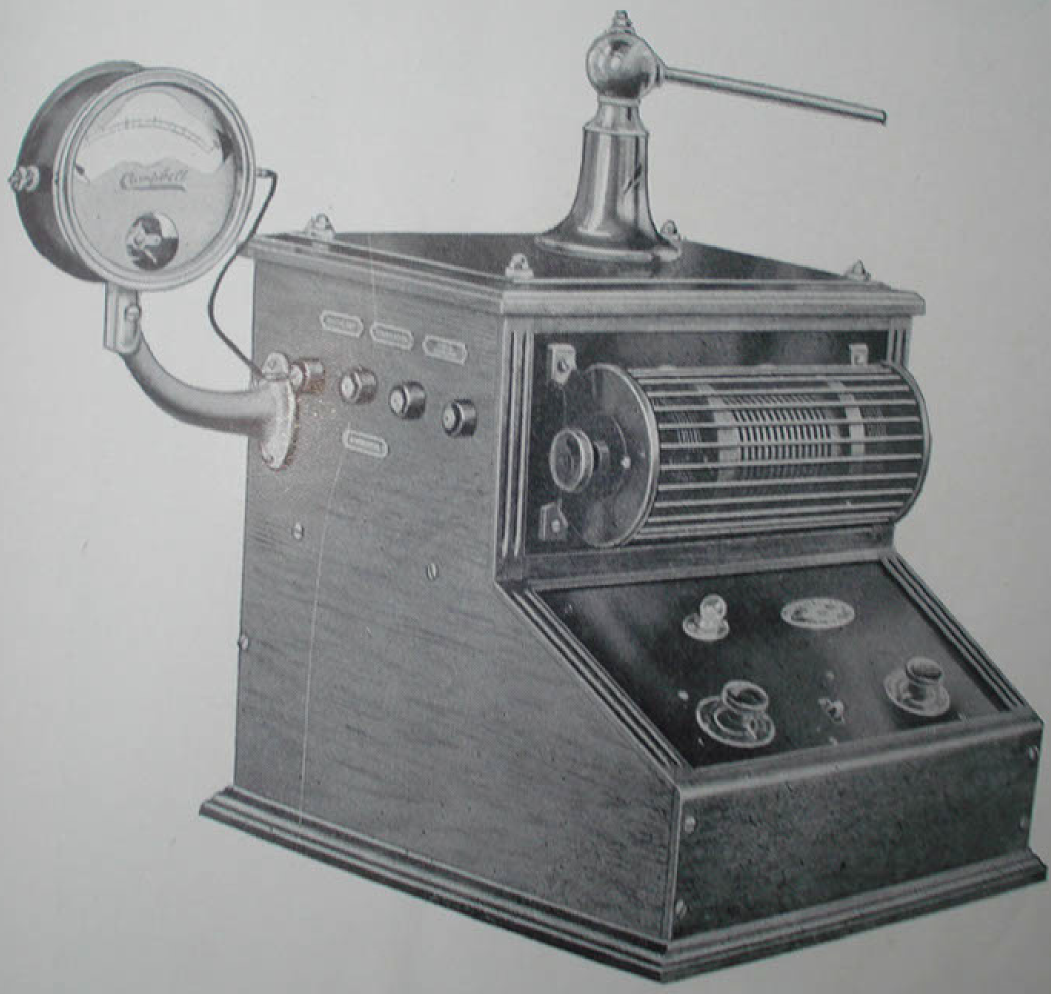
3" to 5" Spark Gap
6-30 M. A.

Simple
Silent
Safe

The
Ideal Office
Equipment

Catalogue	SPECIFICATIONS	Price
12130	Transformer only	$270.00
12131	Cabinet with Control Panel, Cords, etc.	265.00
12132	Tube Stand, counterweighted type	150.00
12125	Lead Glass Shield for Tube	25.00
12112	Coolidge X-Ray Tube, radiator type	125.00
12107	Foot Switch	15.00
12135	**CLINICAL X-RAY UNIT COMPLETE as listed above (Code Word "Clinical")**	**850.00**
12119	Automatic Time Switch, hand type, 0-12, Second Scale	48.00
12110	Circuit Breaker, oil type	45.00
12136	**CLINICAL X-RAY UNIT COMPLETE and with Hand Timer and Circuit Breaker (Code Word "Clinilac")**	**943.00**
13200	Plain Table for use with above	50.00
12113	Flat Top Table with Blocks	85.00
12114	Flat Top Bucky Diaphragm	260.00
12118	Rotary Converter for Direct Current	265.00

"CA"



JULY 15, 1928

PRICE LIST

X-RAY AND PHYSICAL-THERAPY APPARATUS

ACCESSORIES AND SUPPLIES

Campbell
ELECTRIC CO.
LYNN, MASS

ALL PRICES ARE F. O. B. LYNN, MASS.
and subject to change without notice
Always order by Catalogue number and give full description. Cash discount quoted on request

CAMPBELL ELECTRIC MFG. CO.
Campbell Building *15-19 Stewart Street*
LYNN, MASSACHUSETTS

SureX
Interrupterless Transformer
No. 1

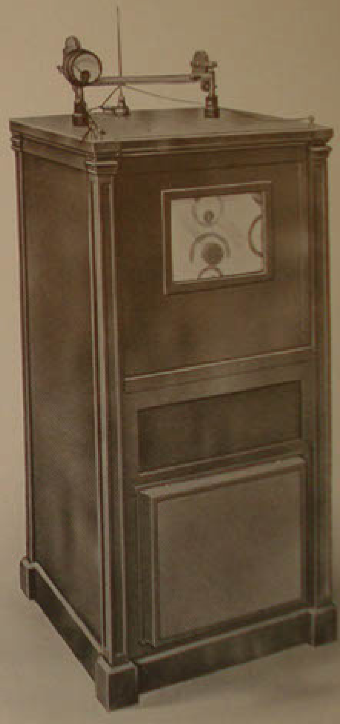
THIS latest addition to the Campbell line of transformers has been designed to supply the demand of the general practitioner and surgeon for an inexpensive but powerful Roentgen Ray Generator of sufficient capacity to do all classes of work with the exception of gastro-intestinal work without taxing its full output, and to make clear, contrasting radiographs rich in detail in quick time, also one who does not consider the Roentgen work which his own practice will yield sufficient to warrant an investment of from fifteen hundred to three thousand dollars and at the same time IS NOT satisfied with apparatus limited to radiography of the bony structure.

Roentgenography

The SureX No. 1 IS NOT a small transformer but one of ample capacity to do practically all abdominal work with the exception of rapid gastro-intestinal work, in which case it would not be recommended nor could it be expected to accomplish the work of the larger SureX.

The power of the larger SureX is required to make radiographs of the active viscera rapidly enough to eliminate the peristaltic wave and produce the distinctive demarcation so necessary to facilitate correct diagnosis.

The SureX No. 1 will make radiographs of any part of the body in from three to five seconds, including the spine, head, frontal sinus, pelvis, heart, lung tissue, renal, urinary and biliary calculi.



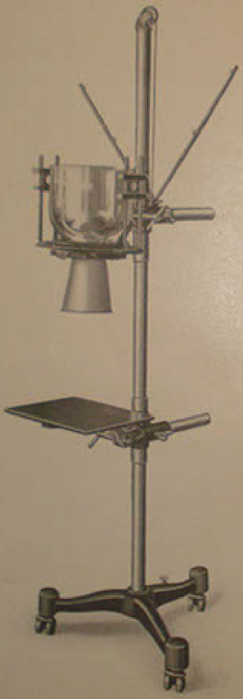
EQUIPMENT

The SureX No. 1 is regularly equipped with:

1. Lead Protective Screen which is a part of the cabinet, contains leaded glass window, which may be quickly raised into position for use, as illustrated on front page, affording protection to the operator.
2. Secondary Voltmeter.
3. Miliammeter.
4. Polarity Indicator.
5. Parallel Spark Gap Indicator.

Metal Tube Stand

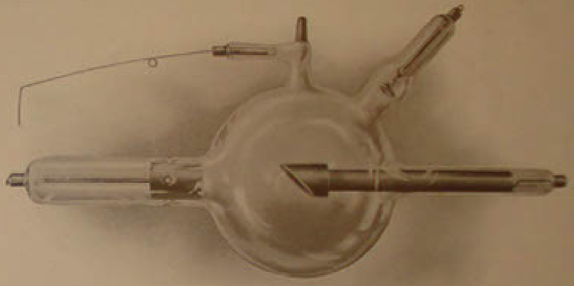
Constructed entirely of metal. Finished in polished nickel plate. Large steady base supporting steel tube. Provided with heavy lead glass tube shield. Slot provided for use of various sizes of lead diaphragms to change size of exposure area. Cord spreaders to hold conducting cords in position. Tube adjustable to all necessary angles and heights. Provided with adjustable universal table for light work.



PRICE

No. 12, Tube Stand counterbalanced, with one cone, diaphragm and adjustable table	**$85.00**

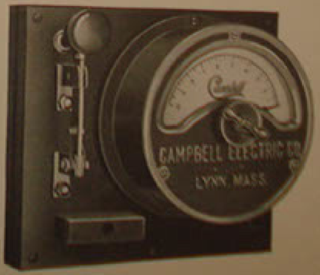
Tungsten Target X-ray Tube



The average purchaser of X-ray apparatus little suspects the responsibility resting on the TUBE furnished with his outfit. All other conditions being equal your tube will control the quality of your work.

Price 7″ Tungsten Target	**$38.50**

Automatic Time Switch



The most essential factor to insure uniform Roentgenography is *correct technique*.

DO NOT GUESS

Short exposures should be accurately timed

An error of one-half second on an exposure of two seconds represents an over-exposure of 25%.

Price, complete with cords and mounting	**$60.00**

Fluoroscopy

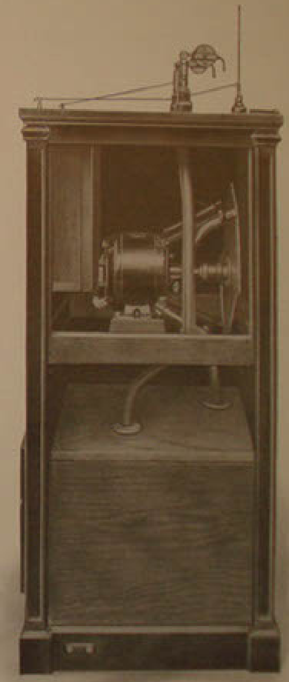
The SureX No. 1 is a most practical machine for fluoroscopic work as its capacity and voltage is sufficient to meet all requirements in this branch of Roentgenology. It is designed with special consideration for its use with a COOLIDGE TUBE with control so arranged that the resistance may be cut out entirely, the current controlled by the filament transformer, and the penetration by selective inductance only. The efficiency of this machine for fluoroscope work is greatly increased by the use of the monoplate type of rectifier, 18 inches in diameter with surface between conductors cut away to prevent carbonization."

Control

The Control of the No. 1 SureX is very similar to that of our larger machines. Regulation of the current is obtained by changing both voltage and miliamperage by means of selective inductance and resistance repectively.

A Secondary voltmeter is provided to register the voltage at the secondary terminals, enabling the operator to determine accurately the penetration of his tube, and to eliminate the guesswork heretofore made necessary by that one uncertain factor, the changeable vacuum of the tube.

The Secondary voltmeter indicates the pressure forcing the current through the tube which was previously determined by the inaccurate method of measuring the back-up spark.



SPECIFICATIONS

Transformer, closed core (non-fluid insulation).
Synchronous Motor, self-starting.
Rectifier, Monoplate type, diameter 18 inches.
Dimensions, 24" x 24" x 77" high to top of screen.
Finish, standard finish mahogany or oak. Weight complete, [illegible] lbs.

Prices

SureX No. 1 fully equipped	$750.00
Lead Protective Screen	
Secondary Voltmeter	
Miliammeter	
No. 12 Tube Stand with Adjustable Table	85.00
Tungsten Target X-ray Tube 7″	38.50
	$873.50

Guarantee

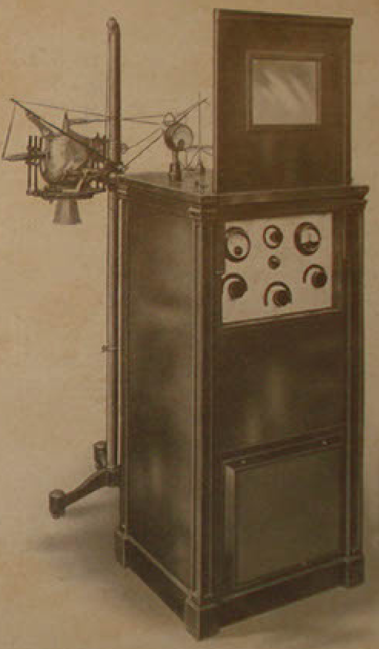
THE CAMPBELL ELECTRIC CO. guarantees the mechanical construction of the X-ray Transformer and will supply, free of charge, any part developing inherent defect within the period of two years from date of sale.

Prices are F. O. B. Lynn. Terms 5 per cent. cash. Easy payment terms quoted on application.

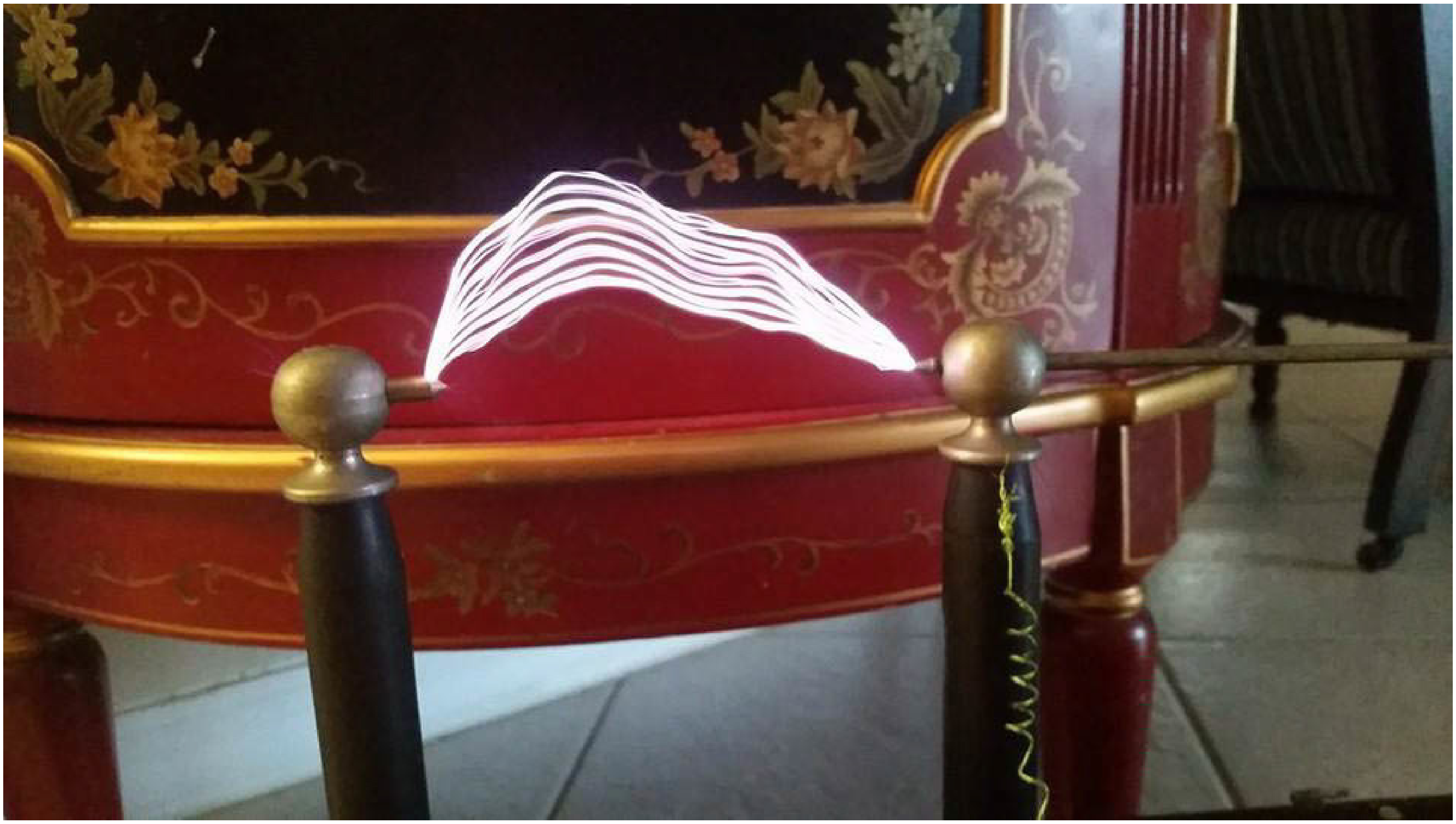
CAMPBELL ELECTRIC COMPANY
(Incorporated)
Principal Office and Factory
LYNN, MASS., U. S. A.

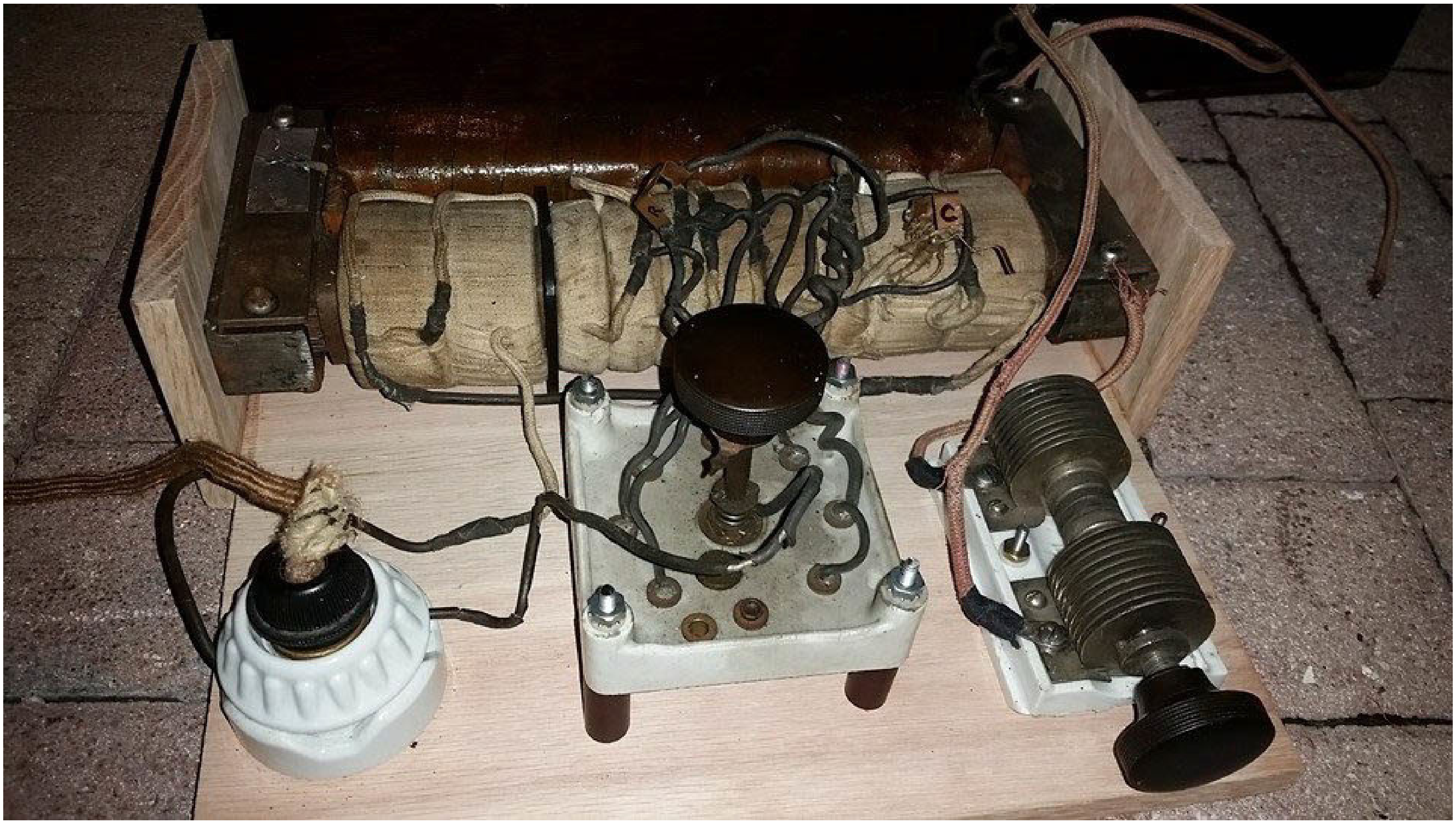
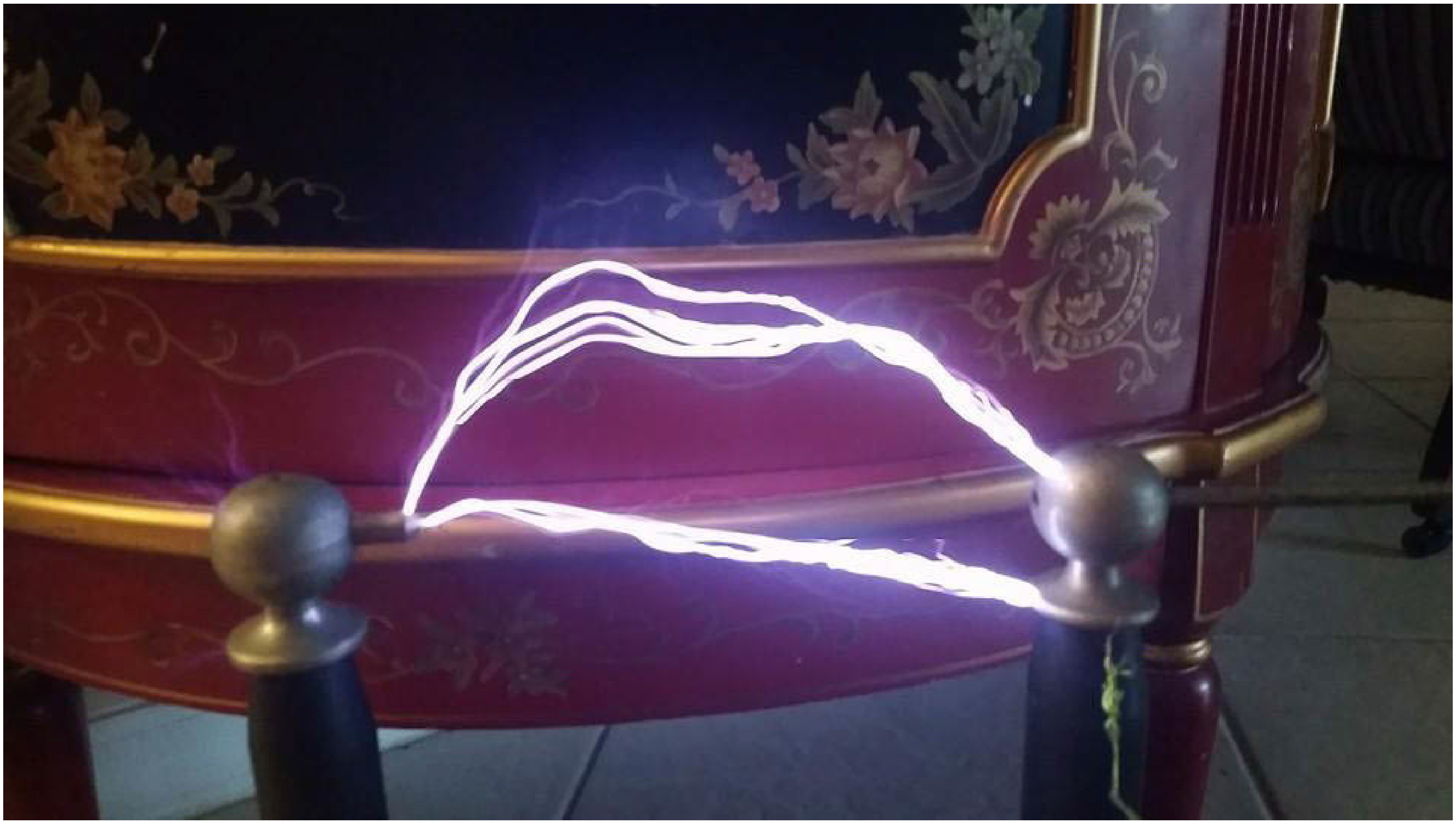
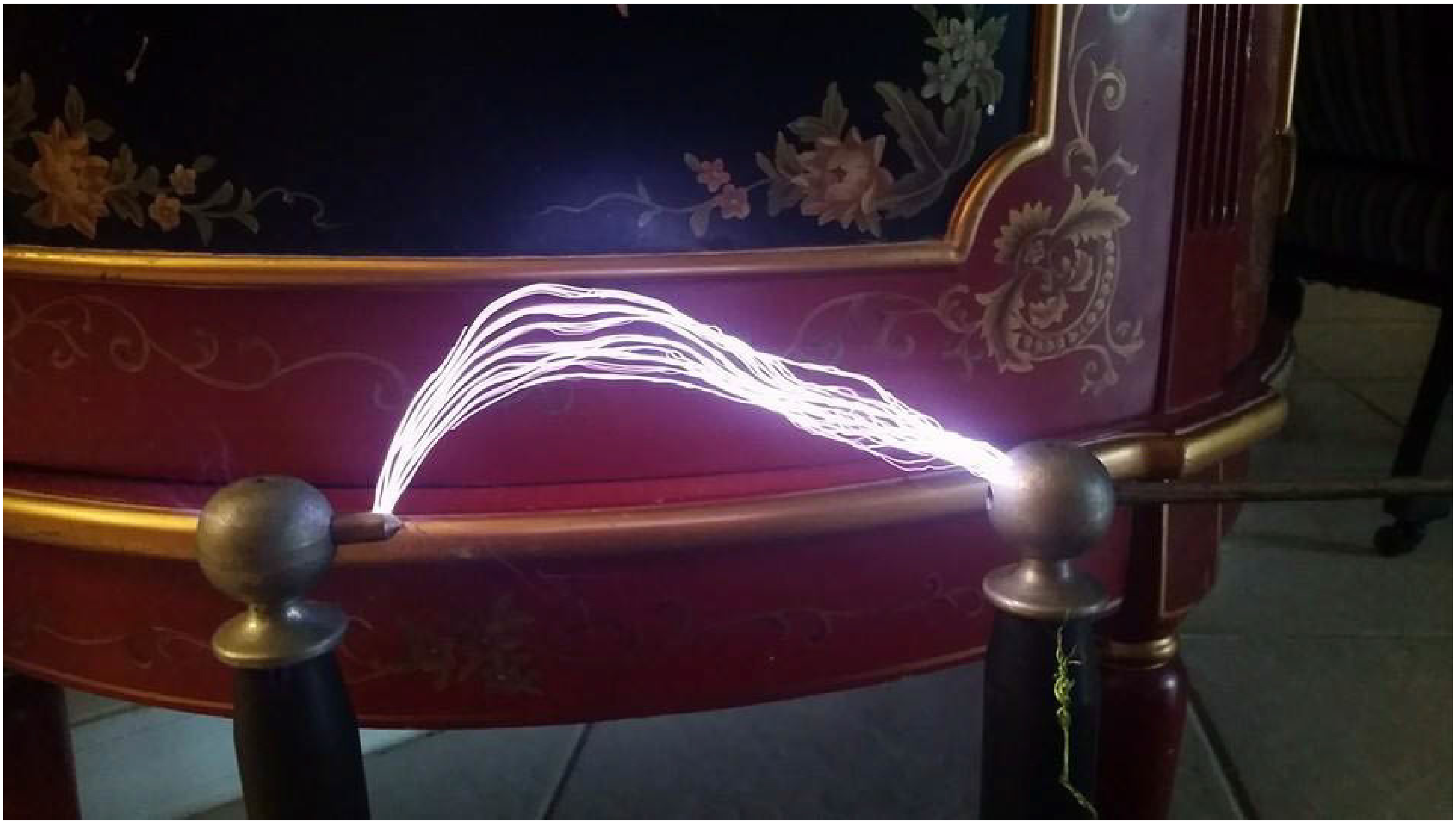
[illegible]

Campbell SureX No. 1



CAMPBELL ELECTRIC COMPANY
LYNN, MASSACHUSETTS




C